THE DOCK & HARBOUR AUTHORITY

No. 146. Vol. XIII. DECEMBER 1932

Editorial

The Port of Rochester, New York, U.S.A.

The Port of Rochester, which is situated in the State of New York and on the south shore of Lake Ontario, was until quite recently comparatively unknown, but the development of the Welland Canal has brought Rochester into more prominence, and the increase in the quantity of goods dealt with at this port has occasioned the need for new and more up-to-date facilities to cope with this trade.

The new works laid down consist of a new package freight and passenger terminal, and this has just been completed at a cost of $500,000.

Rochester is mainly used as a transhipment port, and previous to this new terminal being laid down the traffic at the port was approximately 300,000 tons a year, but it is expected that now this improvement has been completed the traffic will show a large increase. The new terminal is capable of handling 500,000 tons.

For the construction of this new terminal a quay type of wharf was adopted, and the quay wall is 1,200-ft. in length. Of this length, 804-ft. comprise a typical ocean quay of 30-ft. in width and carries two railroad tracks. Three transit sheds have been allowed for, though up to the present only one has been laid down. The other two will be constructed when traffic has developed sufficiently to warrant the expense of building them.

Considerable thought has also been given to the handling of passengers, as there are between 75,000 and 90,000 passengers handled per year through the Port of Rochester, and a special passenger deck has been constructed to facilitate the embarking and disembarking of passengers.

The new terminal at the Port of Rochester forms the supplement for this month's issue, and an illustrated article by Dr. R. S. MacElwee, who was the Consulting Engineer for the project, appears on another page.

Mersey Docks and Harbour Board.

The annual meeting of the Mersey Docks and Harbour Board was held recently, and the report presented showed that the past year had been a better one than the previous year, though far from satisfactory.

The revenue of the port for the year had decreased by £69,097, due chiefly to decreases in rates and dues, rents of property, dock traffic, etc., group, and warehouses—surplus.

More traffic was handled at the docks, though by a lesser number of ships.

Compared with the falling off in receipts, there was a greater reduction in expenditure, which amounted to £146,537.

A comparison of the number and tonnage of vessels which have paid rates to the Board for the two years ended July 1st, 1932, are as follows: The number of vessels paying dock tonnage and harbour rates for 1932 was 19,363 and the tonnage 19,080,728, whereas in 1931 the number of vessels was 19,731, with a total tonnage of 19,843,228. There was a decrease of 368 vessels and 762,500 tons in 1932 as compared with 1931.

Tees Conservancy's 80 Years' Work.

The Tees Conservancy Commission celebrated its 80th birthday on November 1st. The immense strides that have been made in the industries since the authority took charge of the river is almost inconceivable. In 1852, when the Commission was formed, the river was extremely narrow and little of it was navigable even for small craft, but now the breakwaters have made the entrance to the port very safe, and the river has been adequately widened. The Commissioners have done more than this—they have reclaimed nearly 4,000 acres of foreshore, adapted the land for industrial developments, and their handiwork is revealed by the great works now situated thereon. The Commissioners' work is still not completed, and important schemes for widening and deepening the channel at a cost of over half-a-million pounds and reclamation of another 267 acres of land on the north shore are being developed gradually.

In view of all this endeavour it is pleasing to be able to record that latterly there has been signs of improvement in the trade on the Tees, and the figures of the iron and steel exports from the river during October give promise of increased activity in this staple industry of the district. The exports during October exceeded those of September by about 5,000 tons, and there is an increase, though only small as yet, in the shipment of manufactured iron and steel.

The Port of Harlingen.

The Port of Harlingen is the most important of the ports in the north of the Netherlands, it being the chief import and export harbour for the provinces of Friesland and Groningen.

Considerable trade is carried on with England, the chief imports consisting of coal and coke. For the purpose of this trade there is a good service of steamers which run twice a week from London, Hull and Goole.

Recently there has been an improvement made to one of the basins called the New Willemshaven, which now makes it possible for more and larger sea-going vessels to enter, and in connection with this improvement storage sheds are now being constructed and loading and unloading installations supplied both for handling coal and general cargo.

The chief basins at the Port of Harlingen and their measurements are as follow:—

Willemshaven, which is 506-ft. long, 330-ft. wide, has a length of quayage of 1,160-ft. with a depth of 19-ft. of water at high tide. The quayage has rail tracks laid down so that goods are loaded direct from wagon into ships.

The New Willemshaven is 3,340-ft. long, 460-ft. wide, and has 1,360-ft. of quayage with a depth of water at high tide of 15 to 19-ft. Buitenhaven is 726-ft. long and has 350-ft. of quayage with a depth of 17-ft. of water at high tide.

Zuiderhaven is 1,720-ft. long, has a quayage of 3,000-ft. and a depth of water of 14-ft. at high tide. Zuiderhaven has also an electrically driven slipway 225-ft. long with a depth on keel blocks of 11-ft., also a floating derrick with a lifting capacity of 25 tons.

Corriegenda.

In the August, 1932, issue of "The Dock and Harbour Authority" there appeared an article on the 175-ton electric cantilever crane at Glasgow Harbour, and on page 300 in the second column, second paragraph, it is mentioned that "The brake consists of a five-ram Hele-Shaw Pump," but we are now informed that this should be "a five-ram Hele-Shaw Beacham Pump."

The Port of Colombo

Introduction.

THE position of the Port of Colombo at the junction of the most important trade routes in the East has given it a character of strategic importance in the commerce of the East, and this natural advantage has been enhanced by the excellent facilities for docking, bunkering, loading and unloading cargo, water supply, etc., afforded by the port to the vast tonnage of shipping navigating Eastern waters. The Port of Colombo has contributed largely to the commercial and economic prosperity of the Island, and this fact is borne out by the phenomenal growth of the city of Colombo since the conversion of the open roadstead into a great artificial harbour enclosed by extensive breakwaters. Colombo is a great entrepôt, and the volume of business passing through its Custom Houses is an indication of the state of trade and general prosperity of the Island.

Harbour.

The harbour is enclosed on all sides, being bounded on the South and East by the land and on the North and West by massive breakwaters. The approach to the harbour is free from navigational dangers. Vessels drawing 33-ft. can enter by the Western entrance and vessels drawing 27-ft. can enter by the Northern entrance. The Western entrance channel is 630-ft. wide, with a navigable depth of 36-ft. L.W.O.S.T., and the Northern entrance channel 550-ft. wide, with a navigable depth of 30-ft. L.W.O.S.T. The sheltered area of the harbour amounts to 643 acres at low water, of which 229 acres have been dredged to 36-ft. and over, 118 acres to a depth varving between 36-ft. and 33-ft. and 122 acres to between 33-ft. and 30-ft.; the remaining 174 acres have a depth of less than 30-ft.

Accommodation for Vessels.

Berthing accommodation, exclusive of the Graving Dock, Guide Pier and Oil Jetties, is available for 38 vessels in the North-East monsoon, and 23, or using packed berths, 39 vessels in the South-West monsoon. Six of these berths are available in either monsoon for vessels drawing up to 33-ft. of water, one of these being for vessels of unlimited length.

Railways.

A broad gauge railway runs through the port premises and it is connected with the main railway system of the Island, thus affording direct communication with all parts of the Island and Southern India. Sidings are provided at different places on the waterside. The length of the railway is 6 miles 19 chains, but the total mileage of railway used, including sidings, etc., is 14⅝ miles. The port railway is available only for the conveyance of goods.

Roads.

Communication by road to the harbour is excellent.

Canals.

The lake to harbour canal affords direct water transport between stores and mills situated on the lakeside and the harbour. It is navigable by fully loaded 40-ton harbour barges and to some extent relieves the congestion on roads. This canal, together with the lock basin and locks and the water area of the Beira Lake including the San Sebastian Canal locks, is now included in the limits of the Port of Colombo.

Passenger Jetty.

The baggage office has good accommodation and examination halls. There is a staff always on duty day and night, and baggage landed with passengers is passed without delay. There is also provision for the storage of such baggage as a passenger may wish to leave in the premises, a small storage rent being payable. Accommodation is also provided at the Customs House, at the passenger jetty for a Railway Booking and Enquiry Office and a Post Office.

Landing and Shipping.

Landing and shipping of cargo is assisted by an efficient crane service. There is a total quayage of 15,657 lineal feet. The following are the particulars of cranes available at the port:—

Electric Cranes	12
Steam Cranes	30
Hand Cranes	14
Elephant Hand Crane	1
Hand Derrick	1
Steam Derrick	1
Mobile Crane	1

These cranes operate on the jetties and quays; the largest lift which can be made is 35 tons. The conveyance of cargo from the vessel to the wharf is done by lighters and is carried out by recognized stevedores and landing companies.

Cargo for shipment is brought down to the warehouse by cart, lorry, train, or barge. The Port Commission Railway runs direct into the premises alongside three of the export warehouses. With regard to shipment, the same considerations apply as in the case of imports, some firms finding it more convenient to employ a clearing or shipping agency than to maintain their own staff. As in the case of import cargo, goods remain in the Government warehouse at the risk of the exporter. To suit the convenience of shippers who do not carry out their own shipments, landing and shipping companies are prepared to take over cargo at the shipper's stores for removal to the warehouse in the company's own lorries. Export harbour dues are payable on all goods sent down to the warehouses or wharf. If they lie there for more than three clear days, further dues are payable for each day, and in addition a similar sum by way of warehouse rent. Cargo is taken to the vessel by means of lighters. A good supply of labour is available.

Warehouse Accommodation.

Goods discharged being not always directly transferred to some other means of conveyance, it has been found necessary to provide extensive warehouse accommodation for the increasing volume of goods demanding storage, pending shipment or removal from the premises. There is a total warehouse floor area of 592,476 square feet in the port for dealing with imports, exports, and transhipment cargo. Most of the warehouses have railway facilities and cranes are available where required.

The import warehouses are situated between the root of the South-West breakwater and the Lake to Harbour Canal. Other import warehouses and landing areas are also situated on either side of the canal, and these are largely used for the landing of rough cargo, such as timber and metal. Further north, three recently built warehouses are available at Kochchikaade, where facilities are provided for transport by rail.

Five commodious warehouses are allotted for the accommodation of export cargo, in addition to an open shed used for the shipment of drums containing coconut oil and similar commodities, and another shed for rough cargo. The largest warehouse can accommodate 4,000 tons of tea packed in chests of the usual size. The other four warehouses can each accommodate from 2,500 to 3,000 tons.

There are several bonded warehouses within the Customs premises, and certain firms have their own bonded warehouses outside the premises. Goods may be bonded for any period up to two years, after which they must either be removed or rebonded. All goods placed in bond are liable to the same rent and harbour dues as in the case of import cargo up to the time of bonding, after which no further dues are payable and bonded warehouse rent is recovered, the amount payable per week on bonded goods being the same as the charge per day on import cargo. No rent is payable to the Customs in the case of goods which lie in bonded warehouses belonging to private firms, though a charge is made for Customs supervision of deposits and removals. Several firms have their own warehouses and stores on the lakeside, which has direct access from the harbour through the canal and locks. Special facilities are given by the Customs for import cargo to be removed direct to these stores and, conversely, for the direct shipment of export cargo from these stores to the vessel. Rent and dues are, however, payable as in the case of goods landed in the warehouse, but the advantage of this direct traffic lies in obviating two additional handlings which would be necessary had the goods been landed or shipped from a quay.

Transhipment warehouses are available for the accommodation of cargo pending transmission to the destination. No import duty is payable upon such cargo, and rent and harbour dues are payable at a reduced rate, amounting to 1/5th of the rate payable upon ordinary import cargo. In the case of direct transhipment from vessel to vessel, a small fee is payable for Customs supervision. The volume of transhipment is fairly large, the quantity transhipped during the year being about 47,736 tons, but there is a steady traffic with Tuticorin and other South Indian ports of transhipment of cargo to and from the United Kingdom, America, Australia, the Far East, etc.

Removal of Cargo.

Goods may be cleared either by the importer himself or by any landing company or recognised clearing agency. Firms who import on a large scale find it convenient to keep their own staff of wharf clerks for the clearing of cargo and the

The Port of Colombo—continued

passing of the necessary entries through the Customs. On the other hand, firms whose business is not so great as to justify the maintenance of such a staff find it more convenient to clear their goods through a landing company or a clearing agency.

Warehouse rent and harbour dues are payable upon all goods landed at the wharf, and three clear days are allowed for the removal of the goods, exclusive of Customs holidays, of which there are five in the year, and Sundays. On goods removed after the expiry of this period further rent and dues are payable in respect of each day inclusive of Sundays and Customs holidays. Special facilities are offered by the Customs for clearing goods prior to the passing of the entry and the payment of the duty, rent and dues. The usual system is to place a cash deposit with the Customs, against which goods are removed after any examination found necessary, the importer guaranteeing to pass the necessary papers within a reasonable period. Special facilities are also given for the clearing of perishable goods and of consignments, such as rice and sugar, which are landed in large quantities at a time.

Coaling Facilities.

There are about 29 acres of land on the foreshore of the harbour leased to different companies for the stacking of coal. The coaling grounds between the barge repairing basin and the graving dock have 17 coaling jetties. Large supplies of coal can be procured, and steamers are bunkered with good despatch at any hour of the day or night.

The types and prices of coal stocked at Colombo for commercial purposes are as follows (December, 1931) :—

Type	s. d. Prices Trimmed
Welsh, large	44 0 per ton
Welsh ¾ large, ¼ small	41 6 ,,
Natal	31 0 ,,

Oil Facilities.

The port is equipped with an up-to-date oil fuel installation which provides for the rapid bunkering of ships using oil fuel. The main oil installations depot, about 92 acres in extent, is situated at Kolonnawa, about 3½ miles from the harbour front, and various oil companies have erected their own storage and distribution tanks there. This depot is divided into a non-dangerous and a dangerous oil section and is separated by a safety reservation. Three main pipelines are laid connecting the discharge berth in the harbour with the main oil depot, two for oil fuel and the other for kerosene and petrol. In connection with the bunkering of vessels, a measuring tanks depot, about 19 acres in extent, has been established at Bloemendahl, about ¾ of a mile from the harbour front, and branch pipelines are provided from Kolonnawa to Bloemendahl and from Bloemendahl to the bunkering berths. The oil depot is also connected to the main railway system of the island. Three reinforced concrete jetties, two for bunkering purposes and one for discharge of oil tankers, have been provided. The outer oil bunkering jetty is capable of accommodating vessels of 500-ft. length and 27-ft. draught. The inner bunkering jetty is used by barges for bunkering. Vessels of 500-ft. length and 27-ft. draught can be berthed at the discharge jetty, where the latest facilities for discharging oil ships are provided.

Graving Dock.

Length of floor, 700-ft.; breadth of entrance-cope level, 85-ft.; depth over sill at low water, 30-ft.; depth over sill at high water, 32-ft. Docking can be carried out by day or night.

Patent Slip.

Length, 800-ft.; length of cradle, 220-ft.; breadth of cradle, 40-ft.; depth over keel blocks at lower end at low water, 21-ft. 6-in.; depth over keel blocks at upper end at low water. 10-ft. 6-in.; inclination, 1 in 20. Capable of slipping a vessel of 1,200 tons dead weight.

Ambulance Facilities.

An ambulance launch is available for the conveyance of sick and injured persons between ship and shore. The Colombo Municipal Council provides an adequate and efficient motor ambulance service for the port.

Quarantine.

On entering the harbour each ship is visited by the port surgeon or his assistant, and no person is allowed to board the ship or leave the ship till pratique is granted. If there are cases of infectious diseases on board, such as plague, cholera, smallpox, yellow fever or typhus, the ship is held in strict quarantine until all necessary measures, such as removal of the sick person, disinfection of the ship, vaccination, etc., as the case may be, are carried out. Thereafter the ship is allowed to be worked in restricted quarantine, any persons having business on board being allowed on special permits.

Port Commission.

The Colombo Port Commission is composed of the following: The Principal Collector of Customs (who is Chairman or Chief Port Commissioner); the Director of Medical and Sanitary Services; the General Manager of the Railway; the Chairman, Municipal Council, and Mayor of Colombo; the Deputy Collector of Customs; the Master Attendant, Colombo and Galle; the Harbour Engineer; six unofficial members nominated by the Chamber of Commerce to represent import, export, shipping, coaling, oil, and landing agencies interests; two unofficial members nominated by His Excellency the Governor to represent Ceylonese interests.

Bombay Port Trust

At a meeting of the Trustees of the Port of Bombay held on October 18th, 1932, the following were the main items of business disposed of:—

The election by the Chamber of Commerce of Mr. A. B. Mallett as a member of the Board of Trustees *vice* Mr. R. R. Haddow, on leave, was recorded.

The Trustees considered the usual report on the half-yearly revenue up to September 30th. The chairman observed that, although the total receipts were less by some Rs.10½ lakhs than for the corresponding period of 1931-32, the financial position had materially improved during the past two months. The docks receipts for September showed an improvement of over a lakh on the figures for September, 1931; the number of vessels entered and cleared during the month was 375, with a net registered tonnage of 872,330, against 334 of 716,382 registered tons in September, 1931; and the tonnage of cargo handled was better by 35,000 tons. The chairman stated that the improvement had been maintained in the current month up to date.

An estimate for Rs.8,820 was sanctioned for repairs to wharf roads at Lakri, coal and tank bunders.

Amendments of the docks and bunders scales of rates were approved, subject to sanction of Government, altering the classification of travelling rugs from "Apparel" to "Textiles," in accordance with the Customs classification; hitherto travelling rugs have been assessed for wharfage at the higher rate of ⅜ per cent. on the invoice value. The concessional rate of import wharfage on china clay in bulk was, also by amendment of the scale of rates, restricted to bulk discharge into railway wagons.

In response to a representation from the Grain Merchants' Association, the Board decided, in view of the continued depression in the trade, to continue the rebate allowed on rent of the Port Trust godowns at Ryan Grain Market until March 31st, 1933.

Imports and exports at the Port of Bombay for the quarters ended September 30th, 1932, and September 30th, 1931, respectively were as follow:—

	1931 Quarter ended 30th Sept.			1932 Quarter ended 30th Sept.		
	Import Tons	Export Tons	Total Tons	Import Tons	Export Tons	Total Tons
Docks ...	387,520	320,847	708,367	397,952	447,100	845,052
,, (transhipment)	33,078	25,236	63,314	49,651	28,151	77,802
Bunders ...	141,995	25,223	167,218	139,321	21,460	160,781
Total ...	567,593	371,306	938,899	586,924	496,711	1,083,635
Total from 1st April to 30th Sept.	1,303,387	776,750	2,080,137	1,321,558	1,046,488	2,368,046

Vessels other than ferry steamers, hired transports, Government vessels and country craft, which entered the Port of Bombay for the same respective period was as follow:—

	1931 Quarter ended 30th Sept.		1932 Quarter ended 30th Sept.	
	No.	Nett Register Tonnage	No.	Nett Register Tonnage
Vessels engaged in foreign trade	192	851,221	182	741,988
,, ,, ,, coasting trade	250	379,815	235	357,432
Total from 1st April to 30th Sept.	1,140	2,650,413	1,141	2,372,743

Italian Harbour Affairs

THE full statistics which have been published regarding shipping at Italian ports during the first nine months of 1932 enable one to judge the situation of Italian harbours much better than the usual monthly statistics. According to the statistics regarding the period from January 1st to September 30th, 1932, shipping at Italian ports may be summarised as follows:—

ARRIVALS AND CLEARANCES

	No.	N.R.T.	Goods Unloaded & Loaded	Passengers
1932 ...	380,888	118,979,971	22,824,332	6,776,889
1931 ...	363,777	120,436,957	25,032,678	7,144,552

Though the number of vessels arrived and cleared has shown an increase, their net registered tonnage, the quantity of goods unloaded and loaded, and the number of passengers arrived and cleared has shown a decrease. It should be noted that the total decrease in goods arrived and cleared reached 2,208,346 tons, and that the Italian flag has lost 988,741 tons, while foreign flags have lost 1,219,605 tons. It should be noted, however, that the foreign flags still maintain considerable predominance in Italian trans-Atlantic shipping, as during the first nine months of 1932, while Italian ships carried to and from Italian ports in overseas trade 4,301,361 tons of goods, foreign ships carried 6,565,205 tons, which shows that Italian ports still offer an inducement to foreign tonnage.

Before going into the question of the position of the various Italian ports during the last nine months of 1932, it may be interesting to consider the following figures regarding the main items of imports at leading Italian ports for the ten months January to October:—

	Coal Tons	Cereals Tons	Cotton Tons
Genoa	1,798,850	594,501	128,134
Savona	907,006	2,419	159
Leghorn	503,699	65,983	2,200
Civitavecchia	420,198	48,507	—
Naples	532,203	238,222	5,674
Palermo	95,956	518	—
Catania	40,819	41,314	—
Trieste*	315,032	98,879	23,702
Venice	776,481	251,661	38,647
Fiume	20,981	18,920	1,784
Ancona	119,507	138,049	—
Bari	74,119	56,177	—

*January—August 1932

According to estimates which have just been made, imports of coal and cereals have shown an uninterrupted decrease. The decline has been noteworthy at Genoa, where the Consorzio Autonomo del Porto is considering a scheme to increase the advantages offered to foreign transit trade through that port. It is stated that the construction of new concrete warehouses is shortly to be commenced and that even the mechanical unloading facilities are to be enlarged.

The following figures show the situation of each particular port for January to September, 1932 and 1931:—

ARRIVALS AND CLEARANCES
January—September, 1932

		No. Ships	N. R. T.	Goods Imported (Tons)	Goods Exported (Tons)
Savona	1932	2,019	1,829,797	984,574	163,915
	1931	1,866	1,719,383	1,048,730	146,213
Genoa	1932	6,758	13,622,652	3,654,407	675,636
	1931	6,987	14,570,149	4,368,842	636,267
Leghorn	1932	5,287	5,555,464	813,335	266,879
	1931	5,094	5,400,048	866,952	289,631
Civitavecchia ...	1932	1,972	2,826,086	568,843	95,353
	1931	1,914	2,552,430	628,122	73,774
Naples	1932	16,485	14,402,160	1,254,341	214,413
	1931	13,453	14,820,275	1,278,973	257,690
Brindisi	1932	1,719	3,599,691	80,275	9,092
	1931	1,868	3,362,573	83,159	9,235
Bari	1932	2,788	2,306,430	248,587	34,943
	1931	2,575	2,145,867	227,473	41,295
Ancona	1932	3,162	2,014,726	216,890	52,816
	1931	3,154	1,755,299	349,876	53,706
Venice	1932	6,665	7,290,782	1,768,551	336,460
	1931	5,535	6,224,756	1,749,886	357,348
Trieste	1932	28,459	8,149,110	1,230,966	387,861
	1931	25,857	7,487,626	1,339,047	495,731
Fiume	1932	8,551	2,940,406	212,398	139,606
	1931	9,241	3,356,463	253,339	168,186
Messina	1932	5,113	2,552,945	209,767	63,267
	1931	5,767	3,173,013	252,254	91,278
Catania	1932	3,710	2,750,743	253,051	97,647
	1931	3,695	3,007,997	321,762	118,731
Siracusa	1932	1,985	1,775,236	58,797	35,841
	1931	1,919	2,191,811	60,277	42,185
Palermo	1932	7,406	4,997,714	310,417	111,559
	1931	7,724	5,393,546	369,557	107,585
Cagliari	1932	1,841	1,364,643	149,517	205,568
	1931	1,701	1,353,712	154,808	193,679

It will be noticed from the above-mentioned figures that the number and tonnage of ships arrived and cleared has shown a decrease at the largest Italian ports, while the situation has been more satisfactory at smaller harbours, such as Savona, Leghorn, Civitavecchia, Bari, Ancona, etc. With the exception of Bari and Venice, imports at Italian ports have shown a general decline, while in regard to exports there have been slight improvements here and there. The increase in the tonnage calling at ports such as Savona, etc., is due to the fact that several regular services have included, since January 1st, 1932, calls at these ports. This fact has also induced the Labour Offices at each port to cut down rates for discharge or shipment of those goods, which represent the bulk of the trade. At Naples the temporary maritime station on the Beverello Molo has been completed, and the 48,000 gross tons liner "Conte di Savoia," on her way from Trieste to Genoa, has called there, anchoring alongside without any difficulty. An increase has been made in the towage facilities of the Port of Naples by the purchase of a 1,250 h.p. steam tug from the United Kingdom. Most of the western quayage of the Molo Beverello Passenger Station has been completed, and this has considerably facilitated the handling of passengers.

Detailed figures for shipping at all Italian ports during October, 1932, have not been published as yet. However, shipping at Venice during the month of October, 1932, included the following:—

	Imports Tons	Exports Tons	Total Tons
October, 1932 ...	170,048	40,822	210,870
,, 1931 ...	192,863	34,314	227,177
	— 22,815	+ 6,508	— 16,307

The decrease in imports is due to smaller arrivals of coal, while the increase in exports is due to the larger shipments of petrol and fertilisers. The Consiglio Provinciale dell'Economia at Trieste has supplied the following information in connection with trade at that port during October:—

	October 1932	October 1931
By rail	103,840	175,474
,, sea	156,603	220,654
Total tons	260,443	396,128

Regarding the harbour enlargements at Bari, which will involve an expenditure of 167,000,000 lire, it is expected that by June, 1937, there will be completed about 2,400 metres of quayage in that port, of which 1,500 metres will have a depth of water of about 12 metres and an area of 100,000 square metres for the disposal of trade. Further important works are under construction at Brindisi, where the Customs House and the Montenegro Quays are being rebuilt. No less important works are being carried out at Mola di Bari, Manfredonia, Barletta, Trani, Molfetta, Monopoli and Taranto. The total amount allotted for the purpose of improving and enlarging harbour facilities at Italian South Adriatic ports during the ten years from 1922 to 1932 reached 241,245,002 lire.

The Cassa Depositi and Prestiti has been authorised to advance to the Consorzio Autonomo del Porto di Genova the amount of 50 million lire to undertake the construction of the last portion of the Mussolini Dock towards the Polcevera River.

According to information from Tripoli, shipping at that port during the month of September, 1932, included the calling of 113 ships, representing 148,545 net registered tons and carrying about 20,000 tons of goods.

Copenhagen Shipping during October.

A total of 1,894 vessels with a registered tonnage of 514,697 entered the Port of Copenhagen during October as compared with 1,894 vessels and 529,615 tons in September. The vessels included steamers, motor ships and sailing vessels, and the following table shows the participation of foreign countries in this trade:—

Nationality	No.	Reg. Tons.
Danish ...	1,380	354,523
Swedish ...	258	50,568
Norwegian ...	14	15,011
German ...	125	21,700
British ...	18	16,491
French ...	1	813
Finnish ...	22	16,270
Russian ...	2	1,978
Netherlands ...	31	13,198
Belgian ...	1	4,601
Latvian ...	3	3,915
Estonian ...	4	1,891
Icelandic ...	4	1,690
American ...	1	6,510
Japanese ...	1	3,277
Roumanian ...	1	2,261
Total ...	1,894	514,697

The Port of New York

Latest Data issued by the Bureau of Commerce

New York: An Attractive Port for Export Grain.

LOCATED in a section of intense shipping activity on the South Brooklyn waterfront, directly east of the Erie Basin and not far from the Bush and Atlantic Tidewater Terminals, is the New York State Elevator and Canal Terminal, one of the busy spots of the harbour. Here is a modern steamship pier capable of berthing four 500-ft. cargo carriers drawing 30-ft. of water, and elevator through which moves a large part of the grain exported from the Port of New York.

Starting with the opening of navigation on the New York State Canal, grain begins to move steadily via that waterway from Buffalo to New York City throughout the summer, increasing rapidly as the close of navigation approaches, which usually occurs about the first week in December.

As a result, the State Elevator begins to fill rapidly early in the season as the canal fleet brings the grain to this port, and although there is a constant outgoing stream of deliveries to vessels sailing overseas the demand for storage space is continuous throughout the summer and winter months. It is not until spring that the bins begin to empty and make ready for the new crop that flows in with the opening of canal navigation once more.

The grain elevator, which was built by the State and opened in 1922, received and delivered over 20,000,000 bushels last year of which almost 14,000,000 bushels were held in storage for varying periods. Since the elevator storage capacity is 2,000,000 bushels, the amount stored throughout the season shows that the elevator was virtually emptied and filled seven times.

While no small volume is delivered by lighter to shipside where the grain is transferred by means of a floating elevator, more and more vessels are berthing at the State Terminal where the grain is loaded direct to the ship's hold. An overhead gallery running half the length of the pier, houses the two 42-in. conveyor belts that carry the grain from the shipping bins. Each belt is served by two moveable trippers which can divide and divert the grain at two separate points to outside spouts leading to the vessel's hold. This arrangement facilitates the trimming of the cargo. Grain can be delivered into the ship's hold at a rate of 20,000 to 25,000 bushels an hour and quite recently a vessel took aboard 144,000 bushels in the space of five hours. On another occasion, delivery of 233,000 bushels was made in nine hours.

As an indication of the steady growth in the use of State Terminal as a loading point for overseas grain carriers, it is interesting to note that while sixty-three vessels berthed at that pier for grain cargoes during the year 1930, this number increased to eighty-four in 1931 and this year will total over a hundred.

During one period of intense activity, five good-sized cargo carriers loaded cargoes of grain at the State Terminal in less than three days. As the grain can only be delivered to one vessel at a time the efficiency of this particular operation can be better appreciated.

The movement of export grain is extremely sensitive to all influences affecting the delivered cost at foreign destination, and as a result flows by that route offering the lowest cost for transportation, handling, storage, etc. In this respect, New York enjoys substantial advantage over other ports.

Grain moving by the all-water route from the head of the Great Lakes to Buffalo, then via State Canal to New York, where it is transferred to the ocean vessel, can be delivered at foreign destination at a cost of 2 to 5 cents a bushel less than if shipped through other Atlantic ports.

Not only the cost of shipping the grain abroad via New York is low, but also the charges for handling and storage at the State Elevator. In fact, the rates in effect at the State Elevator are lower than those at any other similar facility on the Atlantic seaboard.

In addition to low cost transportation New York offers unsurpassed steamship service, with fast and frequent sailings to all foreign ports, particularly those of grain importing countries.

New York State Canal System.

Unless closed sooner because of ice, clearances on the Erie or Champlain Canals will not be issued after midnight, Nov. 30. Clearances on the Oswego Canal will not be issued after midnight December 3rd.

Up to the end of September, with the close of navigation still two months away, 304,629 tons of sugar have been transported through the canal, compared to last season's total of 303,973 tons.

Some of the principal commodities other than sugar, that have been moving by the canal route this season up to September 30, are as follows:—

Petroleum	697,559 tons	Wheat	553,876 tons
Chemicals	120,073 ,,	Corn	92,092 ,,
Iron and Steel ...	75,896 ,,	Oats	64,330 ,,
Sulphur	53,999 ,,	Rye	53,046 ,,
Fertilizers	55,248 ,,	Salt	30,158 ,,

Value of Foreign Trade at the Port of New York.

The foreign trade at the Port of New York for August, 1932, was valued at $74,675,000, 47 per cent. less than for August of last year. Exports were valued at $31,607,000 and imports at $43,068,000. The decline was 47 per cent. in both exports and imports.

	August		Net Change	
	1932	1931	Amount	Per Cent.
	$	$	$	
Exports	31,607,000	59,214,000	-27,607,000	—46.6
Imports	43,068,000	81,423,000	—38,355,000	—47.2
Exports and Imports	74 675.000	140,637,000	—65,962,000	—46.9

The value of foreign trade at New York for eight months of 1932, amounted to $771,747,000 which is 42 per cent. below the same period last year. Exports declined 48 per cent. and imports 36 per cent.

	January-August		Net Change	
	1932	1931	Amount	Per Cent.
	$	$	$	
Exports	323,689,000	627,702,000	—304,013,000	—48.4
Imports	448,058,000	700,334,000	—252,276,000	—36.0
Exports and Imports	771,747,000	1,328,036,000	—556,289,000	—41.8

Detailed foreign trade figures for July, 1932, show the countries with which foreign trade of New York has been hardest hit. Exports in July, 1932, declined approximately $31,000,000 from the July, 1931, level. The largest loss was in the trade with Great Britain, which fell off $8,000,000, and with Soviet Russia, which fell off $3,000,000. This continues the trend which has been noticeable for several months. Ever since the British import tariff went into effect, March 1st, 1932, exports to the United Kingdom from the Port of New York have been substantially lower than a year ago. These decreases are as follows:—

Exports to United Kingdom from Port of New York:

	1931	1932	Loss
	$	$	$
April	13,898.000	6,327.000	7,571,000
May	12,970,000	4,750,000	8,220,000
June	11,676,000	4,728,000	6,948,000
July	12.066.000	4,192.000	7.874,000

Heavy losses have also been sustained in the shipments of machinery, agricultural implements and other American products to Soviet Russia. The losses from April to July, this year, as compared to last, are as follows:—

Exports from the Port of New York to Soviet Russia:

	1931	1932	Loss
	$	$	$
April	6,667,000	1,454,000	5,213,000
May	4,350,000	1,250,000	3,100,000
June	12,423,000	327,000	12,096,000
July	4,450,000	1,073,000	3,377,000

The loss in exports to the Russian market has been about 85 per cent.

Imports through the Port of New York in July of this year decreased about $47,000,000 under last year. These losses were distributed—$20,000,000 from Europe, $10,700,000 from Asia, $9,000,000 from South America, $6,500,000 from North America, and $1,000,000 from Africa and Oceania. The principal declines in European imports were from Germany and the United Kingdom, in Asia from Straits Settlements and China, and from South America, Brazil, Colombia and the Argentine.

Ocean Cargo Tonnage at the Port of New York.

The tonnage of ocean-borne commerce at the Port of New York during the calendar year 1931, a year of commercial depression, amounted to 51,729,381 tons. This is a falling off of 12 per cent. from the previous year, and is 23 per cent. less than the peak year of 1927.

The Port of New York—*continued*

The percentage changes in the volume of tonnage of 1931 compared to 1930 at the Port of New York in the foreign, intercoastal and coastwise trades, as well as trade with non-contiguous United States territories, are as follows:—

Trade Route	Inbound Per Cent.	Outbound Per Cent.	Inbound and Outbound Per Cent.
Foreign	—17.1	—23.8	—19.3
Intercoastal	—16.0	—16.9	—16.2
Coastwise	— 2.4	—20.3	— 6.3
Noncontiguous	+16.4	+ 2.3	+12.3
All Trades	— 8.3	—21.7	—11.8

Vessel Movements in Foreign Trade.

Entrances and clearances of vessels in foreign trade at the Port of New York during the month of September, 1932, were 22 per cent. and 19 per cent. respectively below the numbers reported for that month last year.

	September 1932	September 1931	Net Change Amount	Net Change Per Cent.
Entrances, No. of Vessels ...	406	523	—117	—22.4
Clearances, No. of Vessels ...	421	522	—101	—19.3
Entrances, Net. Reg. Tonnage	2,276,796	2,724,761	—447,965	— 16.4
Clearances, Net. Reg. Tonnage	2,319,929	2,651,711	—331,782	—12.5

Among the entrances, 39 were in ballast and 367 carried cargo. The clearances included 62 in ballast and 359 with cargo.

For the first nine months of the year, January to September, entrances and clearances were as follows:—

	January-September 1932	January-September 1931	Net Change Amount	Net Change Per Cent.
Entrances, No. of Vessels ...	3,982	4,536	—554	—12.2
Clearances, No. of Vessels ...	4,081	4,689	—608	—13.0
Entrances, Net. Reg. Tonnage	20,996,948	22,799,427	—1,802,479	—7.9
Clearances, Net. Reg. Tonnage	21,096,863	23,060,430	—1,963,567	—8.5

Commerce at Port Newark.

During the month of September, 1932, 30,289 tons of freight were received at Port Newark by vessel. This figure represents a gain of 8,244 tons over the previous month. A drop of 31 per cent. below September, 1931, is due to decreased receipts of lumber, the principal commodity normally handled at this place. The quantity of lumber received by steamer and lighter during the month was 7,104,000 board feet, compared with 18,621,000 feet in September, 1931, a decline of 62 per cent. Receipts by vessel of cargo other than lumber increased from 16,091 tons in September, 1931, to 19,633 tons in that month this year, a gain of 22 per cent. Twenty-four steamers arrived at Port Newark during the month as compared with 17 in the corresponding month last year. Shipments out of Port Newark by vessel totalled 4,027 tons, a decline of 48 per cent. from the same month last year.

Inland shipments of lumber out of Port Newark amounted to 10,903,000 board feet, of which 4,057,000 feet moved by railroad and 6,846,000 feet moved by truck.

The volume of receipts by vessel during the present year, up to and including September, in comparison with the same period in 1931, was as follows:—

Water-borne Receipts at Port Newark:

	January—September 1932	January—September 1931	Net Change Amount	Net Change Per Cent.
All Commodities (tons)	278,024	399,096	—121,072	—30.3
Lumber (board feet) ...	82,331,000	148,295,000	—65,964,000	—44.5
Other Commodities ...	154,678	176,654	—21,976	—12.4

Steamship Passenger Traffic.

Since the first of the year, aliens departing to foreign countries via the Port of New York up to the end of July outnumber alien arrivals almost 2 to 1 during that period. While 9,737 immigrants and 41,469 non-immigrants were admitted in that time, or a total of 51,306 arrivals, emigrants numbering 30,027 and non-emigrants 67,656, totalling 97,683 departures, indicate a net decrease of at least 46,377 aliens residing in this country.

	July, 1932	July, 1931
INBOUND—		
Aliens, Immigrant	1,045	1,699
Aliens, Non-Immigrant	6,407	7,563
U.S. Citizens	19,451	22,442
Total ...	26,903	31,704
OUTBOUND—		
Aliens, Emigrant	6,521	4,284
Aliens, Non-Emigrant	19,348	15,357
U.S. Citizens	45,395	34,639
Total ...	71,264	54,280
Total Inbound and Outbound	98,167	85,984
Total for Seven Months	377,385	422,433

Steamship Sailings.

A further drop in the total sailings from the Port of New York is reported for the month of September. Most of the decline is to be found in curtailed Long Island Sound and Hudson River services which are now being placed on winter schedules. However, the total of 1,199 sailings, of which 305 were direct to foreign ports, represents the lowest monthly number recorded for this port in several years, and compares with a high mark of 1,734 reported for August, 1929, including 476 regular direct sailings for foreign service.

In domestic service some of the smaller freight lines have discontinued operating to up-state points and which accounts for the decline in Hudson River sailings. While the number of sailings has been curtailed to meet the decreased freight movement brought about by general economic conditions, the Port of New York offers almost 200 foreign and domestic steamship services with fast and frequent sailings to all parts of the world, sufficient to meet the requirements of the most exacting shipper of freight.

On Saturday, September 17, which was the peak day of the month, 66 vessels sailed from New York harbour. Thirty-two of these were direct to foreign ports, and included 4 to the United Kingdom, 1 to the Baltic, 2 to Italy, 1 to South and East Africa, 3 to South America, 1 to Australia, 1 to the Far East, 11 to Caribbean-Mexican ports and 2 to the Canadian Atlantic provinces.

Of the thirty-four domestic sailings, 6 were direct to Pacific ports, 7 to South Atlantic and Gulf ports, 11 to New England, 5 to upstate Hudson river points, 3 coal carriers and 2 coastal tankers.

Grain Exports.

Grain exports from the Port of New York in August, 1932, amounting to 2,480,000 bushels, represented a decline of 25 per cent. from the August, 1931, figure of 3,290,000 bushels. Exports of domestic grain showed an increase of 348 per cent. over the corresponding month last year, while Canadian grain in transit fell off 47 per cent.

	August 1932 Bushels	August 1931 Bushels	Net Change Amount Bushels	Net Change Per Cent.
Domestic and Canadian Grain	2,480,000	3,290,000	—810,000	—24.6
Domestic Grain	842,000	188,000	+654,000	+347.8
Canadian Grain	1,638,000	3,102,000	—1,464,000	—47.2

The total exports of grain for the eight months since the first of the year were 30,221,000 bushels as compared with 41,925,000 bushels during the same period in 1931, a drop of 28 per cent. The exports of domestic grain showed a very substantial increase, registering a gain of 7,042,000 bushels, or 205 per cent. Canadian grain in transit fell off 49 per cent. during the period as compared with last year.

	January-August 1932 Bushels	January-August 1931 Bushels	Net Change Amount Bushels	Net Change Per Cent.
Domestic and Canadian Grain	30,221,000	41,925,000	—11,704,000	—27.9
Domestic Grain	10,477,000	3,435,000	+7,042,000	+205.0
Canadian Grain	19,744,000	38,490,000	—18,746,000	—48.7

Receipts of Grain and Visible Supply at the Port of New York.

Deliveries of grain at New York Harbour in the month of September, 1932, amounted to 2,402,247 bushels, including both domestic and Canadian, and was 64 per cent. less than was received in the same month last year, when the amount reached 6,594,739 bushels. Railroads delivered 163,300 bushels, while 2,238,947 bushels arrived by way of the canal.

Receipts (Bushels):

	September 1932	September 1931	Net Change Amount	Net Change Per Cent.
All Grain	2,402,247	6,594,739	—4,192,492	—63.6
Wheat	2,068,985	6,317,247	—4,248,262	—67.2
Barley	—	—	—	—
Corn	156,962	57,200	+99,762	+174.5
Oats	172,900	169,200	+3,700	+2.2
Rye	3,400	51,092	—47,692	—93.4

The receipts of grain for the first nine months of the year, January to September, was 28,114,561 bushels, 40 per cent. less than in the same period last year.

Receipts (Bushels):

	January—September 1932	January—September 1931	Net Change Amount	Net Change Per Cent.
All Grain	28,114,561	46,964,342	—18,849,781	—40.1
Wheat	23,644,671	40,722,350	—17,077,679	—42.0
All Other	4,469,890	6,241,992	—1,772,102	—28.4

Of the above, 16,548,596 bushels were routed to the port via the New York State Canal as compared with 28,577,742 bushels during the same period in 1931, a difference of

The Port of New York—continued

42 per cent. Railroads carried 11,562,700 bushels, which was 37 per cent. less than last year's figure of 18,380,600 bushels. Receipts of Argentine corn accounted for 3,265 bushels in the period this year as against 6,000 bushels last year.

The visible supply of grain in the harbour, both in elevators and afloat on October 1, 1932, was 2,400,000 bushels, 56 per cent. less than the supply on October 3, 1931, the nearest comparable date.

Visible Supply (Bushels):

	October 1 1932	October 3 1931	Net Change Amount	Net Change Per Cent.
All Grain	2,400,000	5,519,000	—3,119,000	—56.5
Wheat	1,952,000	5,432,000	—3,480,000	—64.2
Barley	3,000	22,000	—19,000	—86.3
Corn	74,000	—	+74,000	—
Oats	23,000	28,000	—5,000	—17.8
Rye	348,000	37,000	—311,000	+840.5

Hull and the Humber

L. & N.E. Railway to undertake Stevedoring Work at Hull Docks in the New Year.

A NEW departure is being made at Hull by the London and North-Eastern Railway, the owners of the docks, who, through their district goods manager (Mr. E. V. Taylor) have intimated to shipowners and shipping agents that as from January 23rd next they will be prepared to undertake stevedoring work at the Hull docks. The working arrangements will be under the control and supervision of the respective dock superintendents. The King George and Alexandra Docks are to form the eastern section under the dock superintendent at Alexandra Dock, while the Albert and William Wright, Victoria and Town Docks will form the western section under the dock superintendent at Neptune Street. Hitherto the London and North-Eastern Railway have confined their stevedoring operations to the discharging of grain into the silo at King George Dock, but now it is proposed to launch out on a larger scale and cover the entire dock estate. A schedule of charges and conditions, it is announced, will be issued in due course. Up to a few months ago the general stevedoring work at the port was done by firms and members of the local Stevedores' Association, who allocated stevedores to the different shipowning firms and agents. With a view to bringing about a reduction in charges, two independent firms began operations, and now their example is being followed by the owners of the docks. It is not known whether the London and North-Eastern Railway will extend their new venture to Grimsby and Immingham, but it is considered not improbable, should the step taken at Hull prove successful.

Improved Handling Facilities at Alexandra Dock, Hull.

In order to improve the facilities at the Alexandra Dock, Hull, the London and North-Eastern Railway are installing 19 electrically operated cranes for the purpose of the better handling of general merchandise. They range in capacity from 2 to 10 tons, and take the place of hydraulic cranes, which, having fixed jibs of insufficient height and reach, cannot properly deal with cargoes of the larger vessels now using the dock. In addition, it is proposed to provide new capstans and mooring bollards and make alterations to the railway lines on B Jetty and Nos. 7 and 8 Quays. The cranes are being transferred from Middlesbrough, where they have been displaced by new cranes.

Good progress is being made with improvements in other directions at the Hull docks, more particularly in the modification and reconstruction of coal shipping appliances. Originally intended to deal with wagons of 10 to 12 tons, the work in hand will extend the usefulness of the appliances to 20-ton wagons, which are now being brought into service in the South Yorkshire coal export trade. At the St. Andrew's Dock, the home of the fishing industry, good headway has been made in the reconstruction of the old, or No. 1 quay. This stage is to be 1,600-ft. long and the floor is to be widened from 60-ft. to 90-ft. The work of reconstructing a slipway to accommodate the largest fishing trawlers afloat has been commenced, and in order to provide alternative accommodation temporarily special berths have been provided in the graving dock at the William Wright Dock.

Extended Use of the Oil Port at Saltend.

Extended use continues to be made of the oil port at Saltend, east of the King George Dock. During October over 14 million gallons of petroleum and motor spirit came to hand. At the depôt the leading oil companies have installations and refineries. Two jetties with pipe lines are connected with the port, at which incoming tankers discharge at all states of the tide. The trade in petroleum and its products at Hull has grown enormously in recent years, and from 10 to 12 million gallons per year the imports now exceed 120 million gallons annually and are likely to still further increase.

Efforts to Attract More Trade to Hull Docks.

Intensive efforts are being made by the Hull Development Committee to attract more overseas trade to the port. Leading importers in the Midlands and the North of England are being invited to consider the possibility of economies in the distribution of their goods by using Hull for the purposes of import in preference to centralising so much on London. It is pointed out that Hull, with its cheap methods of discharge, storage and distribution, offers unrivalled opportunities to firms whose business is favoured by the effect of the nation's tariff policy. In ordering shipments to Hull it is stated that it will generally be found that no extra freightage is involved, most shipping companies offering the option of discharge at London or Hull; while the methods of dealing with cargoes at the Hull docks enable considerable savings to be made.

Obituary.

Regret is felt at the death of Mr. William Seymour Hide, managing director of Earle's Shipbuilding and Engineering Co., Hull. Mr. Hide was very widely known and esteemed throughout the port. He came to Hull in 1899 as manager to Messrs. Amos and Smith, boilermakers and ship repairers, and shortly afterwards became a partner in the firm, and afterwards managing director, on the business being converted into a limited liability company. He was also at one time chief superintending engineer to the Ellerman Wilson Line, but retired from that position some years ago. Mr. Hide was 71 and for a number of years had been president of the Hull Iron Trades Association.

Scheme for the Repair of North Pier, Bridlington.

The Bridlington (East Yorkshire) Harbour Commissioners have under consideration a scheme for the repair of the north pier, dealing mainly with the outer or seaward wall, which has suffered extensive damage. The estimated cost is £1,200, and it is hoped to have the preliminaries over in good time so that the work may be done as far as possible in the coming winter months. A larger scheme which the Bridlington Corporation have under consideration to connect the north and south parts of the sea front by the construction of a new road will involve some rearrangement of the accommodation for shipping in the harbour. The proposal will somewhat reduce the water area, but by the road running along on its land side the harbour will be "opened out," and possibly its usefulness increased.

Shipments of Slag from Immingham.

A large quantity of slag is being shipped to Belgium through Immingham Dock from the iron and steel works at Scunthorpe. The s.s. "Letchworth" (717 tons net) has been chartered to make consecutive trips to Ghent, taking about 1,800 tons each voyage. It is reported that the total consignment exceeds 30,000 tons.

Traffic in Duisburg-Ruhrort Harbours.

The following figures show the traffic in Duisburg-Ruhrort Harbours from January to September:—

	Jan. to Sept. '32 Tons	Jan. to Sept. '31 Tons
Total Traffic	7,862,000	11,300,000
Coal Traffic	5,820 370	8,464,000
Arrivals of Ore	203,000	630,000

With regard to the above arrivals of iron ore the figure is practically of no importance, for the "Schedenerzgesellschaft" states that 1.5 million tons of ore travelled up the Rhine *via* Rotterdam during the period January to August, inclusive. The greater part of this quantity was for use in the Ruhr area.

Nevertheless, one can see from the traffic in Duisburg-Ruhrort Harbours, which amounts to about 50 per cent. of that in 1913, that the importance of the Duisburg-Ruhrort Harbours as turnover place is diminishing. The decrease in traffic is, of course, due to the industrial crisis, but also to the extension of the waterways in Western Germany.

North-East Coast Notes.

Brighter Trade Outlook.

THE trade outlook on the North-East Coast in the early days of November were, generally speaking, more promising than they had been for some little time. Coal shipments, upon which so much depends, were good, and the idle tonnage which for so long has virtually choked the rivers was still diminishing, even if slowly.

Tyne and Wear Coal Prices.

The question of differentiation in coal prices as between the Tyne and the Wear has been brought into renewed prominence by the decision of Mr. Justice Maughan in the Chancery Division, which was to the effect that there could be only one minimum price for each class of coal produced in Great Britain, and that the defendants—the Executive Board and the Sales Committee appointed under the Midland (Amalgamated) District Coal Mines Scheme—had not the right to differentiate as to the categories of consumers on merely geographical lines, and the resolutions of the Executive Board in fixing separate minimum prices for the East and West Coast ports could not be supported. With regard to the fixation of minimum prices for bunker coal on a f.o.b. basis, his lordship pointed out that the Executive Board had acted within its powers, but that there must be one such price for the same type of bunker coal at every port in Great Britain. An appeal against this decision is stated to be pending. Generally, it is claimed that this decision entirely justifies the River Wear Commission in its attitude on the matter, as well as that taken up by certain local coal companies. As the question is still *sub judice* at the time of writing, it may well be left at this point for the time being.

Tyne and Danish Exhibition.

An interesting report on the British Trade Exhibition at Copenhagen and the part the Tyne Improvement Commission took in it was submitted to the members of the latter body by the Chairman of the Board (Mr. H. P. Everett) and the General Manager (Mr. R. Aughton). It was noted that the only British port authorities having stands at the Exhibition were the Port of London Authority and the Tyne Improvement Commission. It was stated also that a film of the River Tyne, with the subtitles printed in Danish, was exhibited each day at the Exhibition, either at the open-air theatre in the Tivoli Gardens or in the Industries Hall. The film, which attracted large audiences, was left in Copenhagen for exhibition in commercial circles throughout Denmark.

Tyne's Improving Trade.

Mr. R. S. Dalgliesh, speaking at the October meeting of the Tyne Improvement Commission, and alluding to the general coal trade of the river, said September had been the best month since April. Scandinavia, Finland and West Indies all continued to take a larger volume of trade than in the last year or two. Italy, too, had taken 44,000 tons more from the Tyne in the previous month than in the September of last year. Canada also showed a considerable increase on previous figures. The home trade was in advance of last year by nearly 180,000 tons. As to the return of traffic diverted from the Tyne by the discrimination in prices as between the Tyne and Wear ports, he thought that it was correct to say that some part at least of the 180,000 tons, and possibly some part of the export trade as well, was traffic which had returned following the rectification of prices made in July.

At the same meeting it was reported that the coal and coke shipped from the river in September approximated to the figures of a year ago, but were greatly below those of the pre-war year. In the nine months ended September 30th the shipments were 9,315,778 tons, compared with 10,377,179 tons in the corresponding period of last year and 15,068,621 tons in 1913.

At the same meeting it was announced that idle tonnage in the river had decreased from 173 vessels of 371,294 tons in August to 163 vessels of 343,106 tons, while at the time of writing the number of vessels had still further dropped to 151, of 327,661 tons.

Port Developments.

Excellent progress is being made with the new coaling staiths of the Hartley Main Colliery, Ltd., at Howden-on-Tyne. It was hoped that one plant will be ready by the end of November and that the complete scheme will be operating at the end of the year. This undertaking, costing about £120,000, will thus have been completed in a little more than a year. The facilities will include two plants each capable of shipping coal at the rate of 500 tons per hour, and will be capable of handling two 10,000-tons vessels simultaneously.

It has just been reported at the Blyth Harbour Commission meeting that the purchase of seven acres of land at Cambois, at the north-east side of the river, has just been completed. This will ultimately be used for the purpose of improving the waiting-berth accommodation adjacent to the West Staiths. The coal shipments for the nine months to the end of September were: 3,470,992 tons, compared with 3,209,492 tons for the same period last year, an increase of 260,000 tons on 1931.

The River Wear Commissioners have decided to instal electrical gear to haul traffic at Roker at an estimated cost of £3,000. The Board also accepted the further recommendation of the Works Committee that repairs should be carried out to No. 19 coal staith at the south docks, the cost of which was estimated to be £2,900.

The Wear trade return up to the end of September showed that for the nine months coal and coke shipments had been 3,418,923 tons, a decrease of 42,025 tons compared with last year. Other exports for the same period totalled 41,567 tons compared with 46,131 tons during the same period in 1931. The imports totalled 215,695 tons, against 227,901 tons for the previous year.

Isle of Man Harbours

Passenger Traffic.

The official passenger figures issued by the Isle of Man Harbour Commissioners show that the number of passengers embarked and disembarked during the year ended September 30th last at the Port of Douglas was 1,027,474½, against 957,259 during the year ended September 30th, 1931, an increase of 70,215. At Ramsey the number was 6,919, against 6164½ in 1931, and at Peel 1,225, against 99½ in 1931.

The days on which the heaviest traffic was handled at the Port of Douglas was—arrivals—on Saturday, July 30th, 31,208½, against 31,018½ on Saturday, August 1st, 1931.

Departures on Saturday, August 6th, 29,424, against 26,082 on Saturday, August 8th, 1931.

Arrivals and departures on Saturday, August 6th, 48,793, compared with 48,533½ on Saturday, August 8th, 1931.

Harbour Works.

Douglas Harbour, Red Pier Extension.—In connection with this scheme the dredging of the softer material and the greater part of the rock has been completed. On Saturday, September 14th, the dredging operations were suspended for the winter months ; the rock-breaker, however, continued work until November 5th. A small quantity of rock-breaking and dredging remains to be carried out, and this it is expected will be completed in the early part of next summer.

The work upon the construction of the masonry pier is in progress and approximately one-fifth of the total amount of walling has been constructed. The construction of the reinforced concrete approach viaduct, extending from the root of the Victoria Pier to the root of the new pier, is in progress.

Victoria Pier: South Side Strengthening.—This work was restarted early in October, and it is hoped that it will be completed for the commencement of the next summer season. In the Inner Harbour the blanketting of the quay wall at the Coffee Palace Berth has been recommenced, and it is hoped to have this completed before the end of the financial year. At Port St. Mary the work of blanketting the quay wall at the inner end of the Old Quay has been restarted, and at Ramsey, in conjunction with the Ramsey Town Commissioners, the surface of Derby Road, being the end of the West Quay near the I.O.M. Railway Station, is being relaid in reinforced concrete, while at Peel it is hoped to complete the repairs to the Old Quay wall. These works have assisted in absorbing a number of the Island's unemployed.

General.

The Harbour Commissioners, in their annual report to His Excellency the Lieutenant Governor, Sir Claude H. Hill, K.C.S.I., C.I.E., state that the matter of the substitution of a fog signal at the head of the Battery Pier, Douglas, for the one on Douglas Head is still under consideration. They also draw attention to the fact that in view of the considerable accumulations of silt and detritus at the harbours of Douglas, Peel, Ramsey and Laxey, it may be necessary to purchase a small dredger, for which there would be a considerable amount of employment.

The Port of Rochester, New York, U.S.A.

New Package Freight and Passenger Terminal Completed

By Dr. R. S. MACELWEE, B.S., M.A.*

THE initial terminal unit at Charlotte was opened to traffic in the early summer of 1932. It offers some new features of interest. The City of Rochester, New York, is 82 miles east of Niagara Falls, situated upon the same rock ridge over which the Niagara River falls, flowing from Lake Erie into Lake Ontario. The community grew up around the falls of the Genesee River, which enters Lake Ontario seven miles farther north, at a village called Charlotte, since incorporated into the City of Rochester. The United States Government has improved the entrance to the Genesee River by two parallel jetties and a channel 18-ft. deep and 150-ft. wide. For many years this has been sufficient. There was a low municipal wharf and a small shed on the left bank, which served the two 32- and 33-year-old side-wheel passenger and packet steamers of the Canada Steamship Company plying from Hamilton to Prescott, Ontario, which call every evening with passengers and package freight and ferry automobiles. These passengers total 15,000 a year.

Trench for quay wall steel sheet piling. Genesee River and entrance jetties to right distance.

The other port activity is that of the Ontario Car Ferry Company, at the Genesee Docks, two miles upstream, owned jointly by the Buffalo, Rochester and Pittsburgh Railroad (now Baltimore and Ohio), and the Canadian Pacific Railroad. These two car-ferries carry upwards of 60,000 to 70,000 passengers a year and 750,000 tons of freight in railroad cars, mostly anthracite coal outbound, and forest products inbound, also general merchandise.

The banks of the river are high, except near the mouth, where the shore is marshy and sub-soil unstable alluvial deposit. There is not a great opportunity for extensive port development in the present harbour. These channel dimensions were sufficient for Lake Ontario traffic, bottled up by the 14-ft. canals of the old Welland to the west and the 14-ft. St. Lawrence canals to the east, to serve transhipment at Montreal. Also the 9-ft. New York State Barge Canal, Oswego Branch, connects Lake Ontario 110 miles to the east of Rochester to the Hudson River and the Port of New York. This condition has continued unchanged for the past twenty years. There was little hope of growth nor more annual traffic than 750,000 to 1,000,000 tons.

Recently several things have happened to change the situation and bring about an imperative demand for adequate terminals. The new Welland Canal was opened in 1931 (official opening 1932) around Niagara Falls, extending large carrier navigation on 22-ft. to 24-ft. draft from the upper lakes down to Ogdensburg, N.Y., and Prescott, Ontario, a lengthening by 250 miles of the Great Lakes System. The United States Government proceeded with the deepening of the connecting channels of the Great Lakes to 25-ft. and the Oswego and Albany branches of the New York State Barge Canal were improved by the State of New York.

Vessels grow to channel limits, and large self-propelled Diesel-electric and turbo-electric canal barges of 2,000 tons were constructed in recent years capable of passing through the New York State Barge Canal, with its actual depth of 9-ft. (projected depth 12-ft.) and under its fixed bridges of 15-ft. 6-in. vertical clearance. These barges were made also sufficiently seaworthy to navigate the open waters of the Great Lakes and the open bays and sounds of the Atlantic Coast. These vessels have been hauling sugar from Baltimore, Maryland, to Toledo, Ohio, for example, at a saving of $6.00 a ton, or $.30 a bag (100 lbs.), a very substantial economy on staples of small profit margins.

Concurrent with this new movement, Mr. Henry Ford has constructed two barges, similar as to function, " The Exiter " and " The Chester," to navigate the lakes and the Oswego-Albany Canal, between his Detroit and Buffalo plants and his Edgewater, New Jersey, plant. These barges utilise every workable foot of the locks. They have a " lift " pilot-house to be lowered for the barge canal transit. The motive power is very high pressure steam turbine.

Another tendency, off-setting the changed situation, is illustrated by the new Ford branch plants. They demonstrate the present definite trend of very large manufacturing plants to decentralise into scattered branch plants, and of the most modern design equipment and site. These branch plants, where possible are being located on deep navigable water, to take advantage of economies of transportation by water from plantside wharves and stock warehouses at ship-side. Belt railroads and highways serve the land side of these new plant locations. It is the Trafford Park, Manchester, idea.

Another factor has contributed to renewed interest in port development on Lake Ontario and the other great lakes. The necessity to save transhipment costs and high per ton mile land hauls from seaboard to the interior, due to rising freight rates, low prices and Panama Canal competition. During the 1931 season 76 ocean-going charters, mostly under Scandinavian flags, but small enough to pass through the existing 14-ft. St. Lawrence Canals (locks 256-ft. long), came to ports on the Great Lakes, to bring china clay, wood pulp, etc., direct from shipper to consignee, without transhipment.

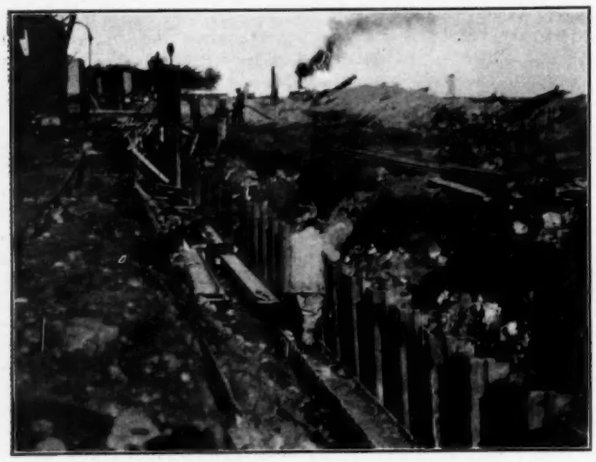
Steel sheet piling wall face in place.

Finally, the signing of the Treaty between the United States and Canada looks toward the rebuilding of the St. Lawrence Canals to Welland dimensions—channels with an immediate projected depth of 27-ft. and 30-ft. lock sills (locks 80-ft. by 820-ft. by 30-ft.), and an ultimate channel depth of 32-ft. This immediate projected depth would admit 66 per cent. of all the world's merchant vessels over 1,000 registered tons, and the ultimate 32-ft. connecting channels 96 per cent. Although there are some " die-hard " opponents in both the Dominion and the States, animated by selfish local interests, it is to be expected that the St. Lawrence seaway will become a reality during this decade and make an American Baltic of the Great Lakes. The Port of Rochester will be 90 miles *closer* to Liverpool than the Port of New York, after deducting 12 knots for each hour of time transiting the 25 miles of ship canal prism and seven locks between Montreal and Prescott. The remainder of the waterway is 2,000 to 10,000-ft. wide and 50 to 110-ft. deep.

*President, MacElwee & Associates, Inc., Consulting Engineers, Specialists in Ports and Terminal Facilities, Cambridge, Mass

The Port of Rochester, New York—continued

Rochester—long isolated by small connecting channels, and also unequipped to handle any appreciable tonnage of general cargo, suddenly finds a new situation, with waterway communications up-lake through the Welland Canal, self-propelled lake-canal barge traffic to the Metropolitan areas of New York, Philadelphia, Baltimore, etc., and present St. Lawrence canals for St. Lawrence boats transhipping at Montreal, and small ocean charters from anywhere, via the St. Lawrence, even at present dimensions. The completion of the St. Lawrence ship channel will make Rochester a seaport for 66 per cent. of all flags by A.D. 1937 or 1938.



Tie-back anchor sheeting and strong back wales.

Rochester is a very active industrial community of 400,000 people. Halfway between Buffalo on the west and Oswego on the east it can count upon a hinterland of about 1,000,000 people. but of a very high annual value of *per capita* output in newly created wealth. Cameras, lenses, optical instruments, films, cinematograph films, radios and telephone instruments, office equipment, such as check-writing machines—but these are not tonnage producing activities. Nevertheless, a community of this size, wealth and activity can support a compact, well-equipped, sea-lake-canal port, and enjoy substantial savings in many transportation movements.

For fifteen years far-seeing citizens at Rochester have been exerting their efforts to provide ample, modern, terminal facilities for lake shipping. Several advisory port commissions have been appointed and several efforts made to establish a regional port authority. At the turn of the year 1930-31 a commission of five was created, two representatives being from Monroe County, two representatives from the City of Rochester, and a fifth member from the Chamber of Commerce.

The firm of MacElwee and Crandall, Inc., consulting engineers, specialising in ports and terminal facilities, was retained to make a comprehensive engineering and traffic survey, with particular emphasis upon the economic justification for port development. This full survey comprised 700 typed pages and over a hundred charts and graphs. The engineering field work covered over 100 square miles of territory, in which soundings and borings were made through the ice during the winter of 1931-32. There were three possible sites—that of "The Ponds," to the west; Irondequoit Bay, to the east; and the present small harbour at the Port of Charlotte, at the mouth of the Genesee River. "The Ponds" developed bed rock at shallow depth and were impractical. An aeroplane and seaplane airport was designed for this area. Flying boat transport is growing rapidly around the Great Lakes. The Genesee River has high banks and bad bottom, but one section is useful for lake-canal-barge shipping. Irondequoit Bay is very deep (80-ft. to 90-ft.), with very high banks (120-ft.), but an area of a square mile of shallow water at the upper (south) end offered an opportunity to develop a complete port layout by the dredge and fill method. Also a railroad out of the valley was located, with favourable minima—0.9 per cent. grades, 8 deg. curves, connecting with all railroad systems and industries, *via* the Industrial Belt Railway. This larger plan of port development awaits the outcome in operation of the initial project at Charlotte. The engineers recommended that the half million dollar project be developed to capacity before embarking upon the five million dollar project.

Preliminary Report is Presented.

Early in the spring of 1931, due to the larger capacity of the Welland Canal and the larger capacity of the self-propelled barges, and lake carriers requesting improved package freight facilities, a preliminary report upon the feasibility of the immediate development of a package freight terminal was called for and furnished by the engineers in advance of the complete port development plan.

This preliminary or initial report showed that there were approximately 300,000 tons a year available for transhipment at Rochester, with a possibility, through proper facilities offering economies in transfer and handling, of 500,000 tons.

An anaylsis of the types of vessels that will frequent the port develops the following five types:—

	Length feet	Beam feet	Loaded Draft feet
Automobile Carriers ...	400	50	18
Canal-Lake Motor Barges ...	257	40	17-19*
Lake Package Freighters ...	300	50	17-19
Car Ferries	360	57	16
Small Ocean Vessels ...	250	42	13

*These barges transit the N.Y. Barge Canal light.

Lake type automobile carriers have a high freeboard and unload from the top deck. For these a special travelling ramp moving laterally upon the ship-side tracks is designed.

Suitable for Different Types.

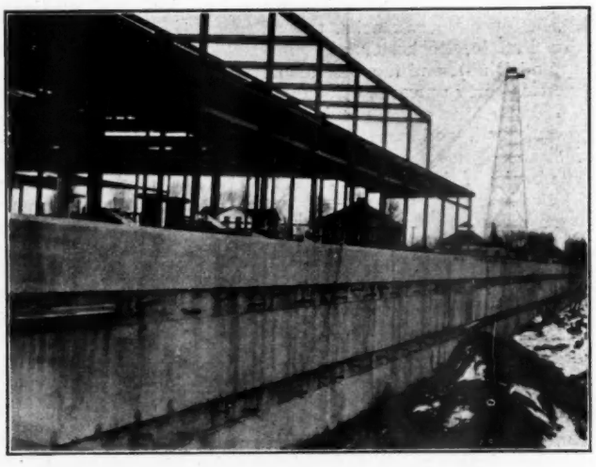
The Barge Canal-Great Lakes Diesel-electric carriers have no handling equipment. They are top hatch loaders with low freeboard. For these it is necessary to transfer the freight by means of crawler cranes with long booms, moving along the wharf. The mobile caterpillar type of motor (petrol) crane is a departure from the standard half-arch gantry of European practice. This is possible because of the low freeboard of the lake-canal carriers. The lake type carriers, including carriers of the Great Lakes Transit Company and the Canada Steamship Company, discharge and load through side ports requiring ramp adjustments to meet fluctuations in the elevation of the deck, due to loading and changes in water level.

Car ferries discharge and load passengers to the promenade deck and load automobiles on their wheels from the stern, for which a "floating" ramp is provided hinged inshore hoisted from a gallows frame outboard.

The small ocean vessels now entering the Lakes through the present St. Lawrence canals have a high freeboard and discharge through top hatches using their own deck winches and booms for transfer.

It will be evident that these widely different types of vessels presented a demand for divergent types of shore equipment.

The waterfront area available between the right-of-way of the New York Central Railroad and Beach Avenue is approximately 1,400-ft. The problem was to construct an efficient terminal offering facilities for the transfer and handling and storage in transit, of package naked and bulk cargo, as well as passengers and automobiles on their wheels, with the maximum economy, efficiency and dispatch in transfer and handling, from widely divergent types of vessels.



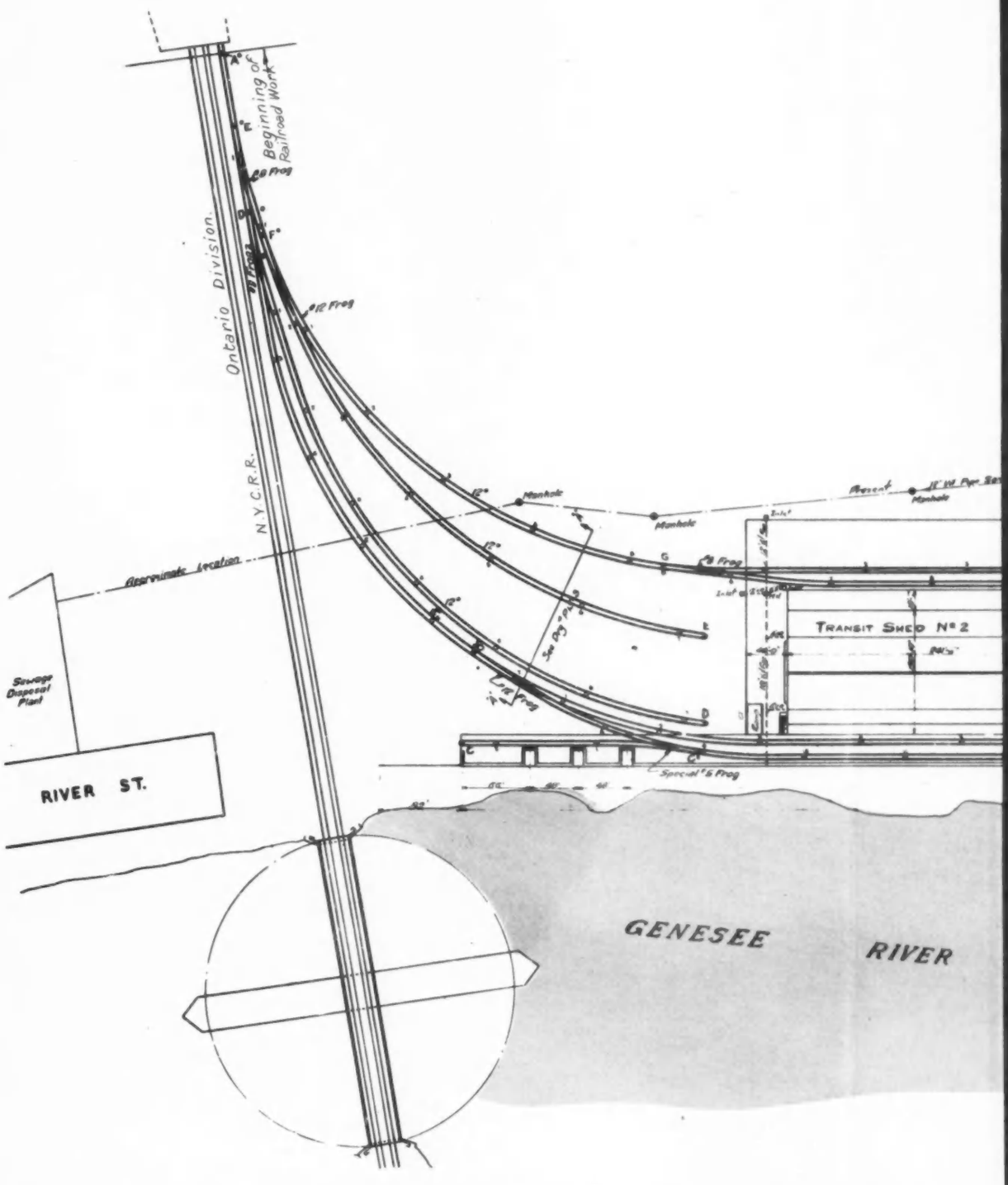
Face of quay wall ready for oak timber fenders and dredging of berth to 22-ft.

Quay Type of Wharf.

To this end a quay type wharf, with marginal tracks and transit sheds, was adopted, the quay wall being 1,200-ft. in length. Of this length, 804-ft. is a typical ocean quay of 30-ft. width of wharf apron, carrying two railroad tracks, the ship-side track being stopped 250-ft. from the north end to permit the installation of the four side port hinged ramps carried on gallows frames opposite Transit Shed No. 3 (not appropriated). At the south end three hinged ramps are provided to facilitate transfer of cargo into the open storage space traversed by the track leads from the New York Central and Baltimore and Ohio Railroads.

PORT OF ROCHESTER.

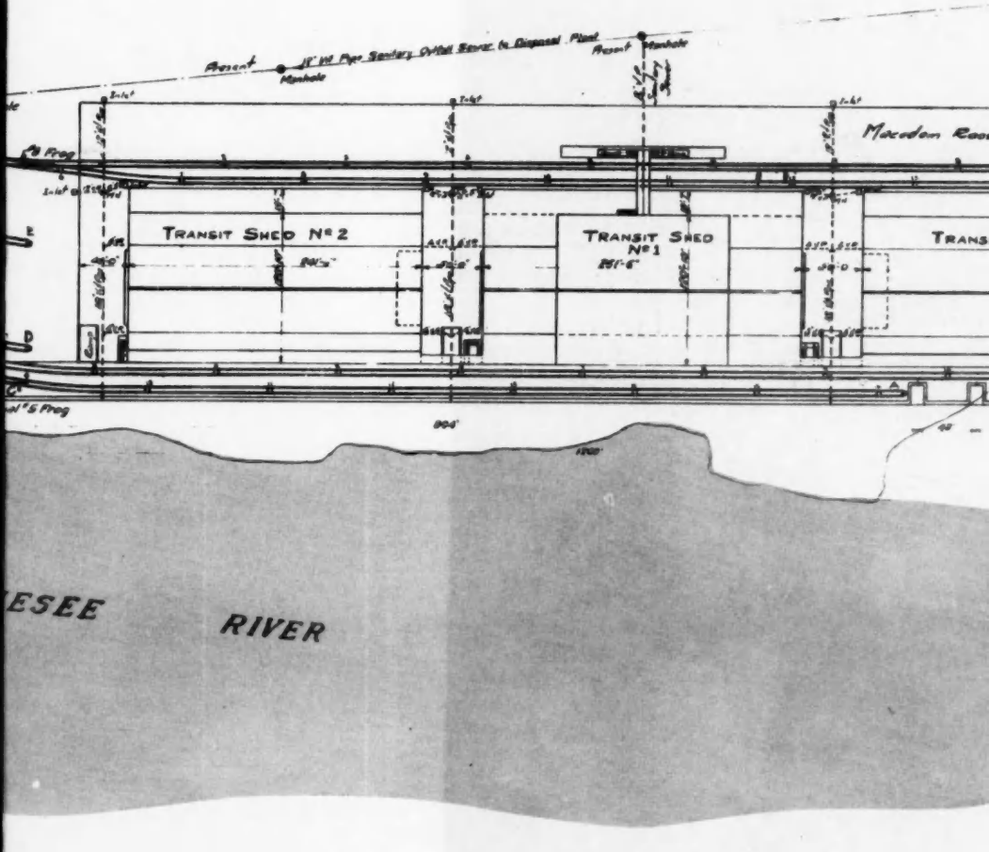
NEW YORK U.S.A.



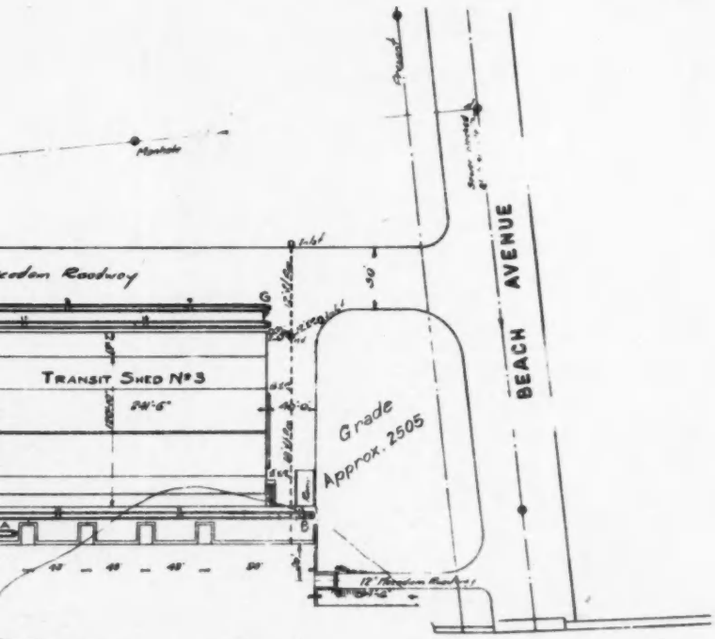
WARD & FOXLOW LTD. (LITHOS

STER.

A.



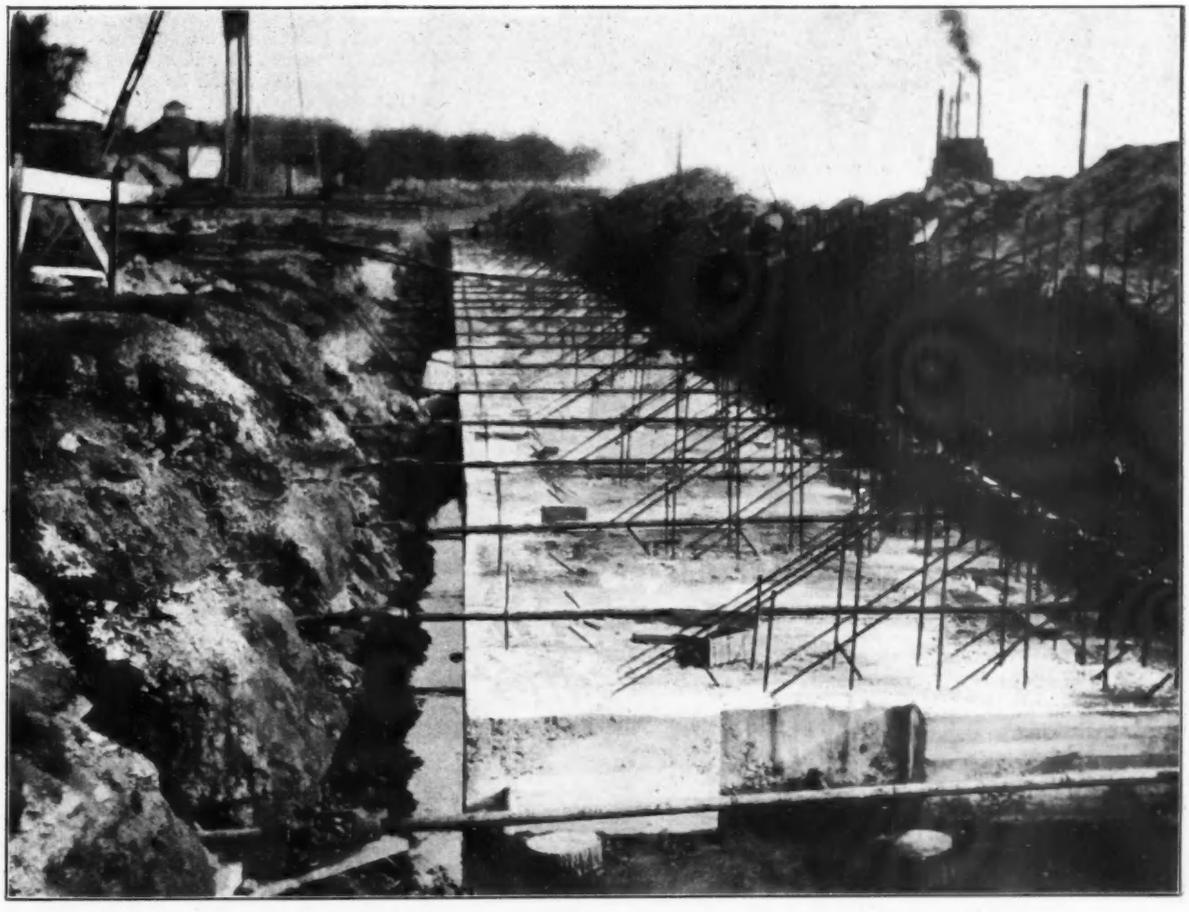
WARD & FOXLOW LTD. (LITHOS.) 19 HARCOURT STREET, W.1



GENERAL LAYOUT
PORT OF ROCHESTER PLAN
CHARLOTTE PASSENGER AND
GENERAL CARGO TERMINALS

The Port of Rochester, New York, U.S.A.

Bearing piles in place.



Relieving platform slab in place expansion joint lock—tie-back rods being placed.

The Port of Rochester, New York—continued

At the north end an additional hinged ramp leading to Beach Avenue and a parking space between Transit Shed No. 3 and Beach Avenue is provided for tourists' automobiles being handled by car ferry, and subject to customs inspection upon arrival and before clearance through the stockade.

This arrangement has made it possible to extend the inside wharf track the entire length of the structure and the ship-side wharf track approximately 800-ft. of this length, still leaving room for the side port ramps at each end of the quay.

Passenger deck showing flood lights for night work.

It is estimated that the Barge Canal vessels out-turn a maximum of 2,000 tons of cargo with an average stowage factor of one and a -half, i.e., measuring on the average 60 cubic feet to the 2,000-lb. short ton. To allow ample room for the use of large quantity skids and industrial lift trucks without high tiering, the central transit shed floor area is 261-ft. 6-in. long by 120-ft. broad—31,380 sq. ft. Transit Sheds Nos. 2 and 3 for future construction are 241-ft. 6-in. long by 120-ft. broad—28,992 sq. ft. A floor area of 10 sq. ft. for each ton w/m. is allowed, with an additional 25 per cent. for aisles and broken stowage.

Between the sheds is a truck court. Because of the limitation of space, this truck court is 50-ft. wide (it should be 70-ft. wide). The pavement of the court is 42-in. below the wharf and transit shed floor. Truck body and transit shed floor are at the same level, likewise box car and loading platform. The pavement of the court is on the same level as the connecting roadways. It is connected with the wharf by a ramp. These courts offer 60-ft. of tail board space at each end of the transit shed, with sliding shed doors, sliding vertically in two sections. In Transit Sheds No. 2 and No. 3 the loading area is set into the building, trucks backing into an additional loading court within the building to compensate for the additional 20-ft. to make 70-ft. Six trucks may load at one time at each end of each transit shed.

Two Railroad Tracks Inshore.

The car loading platform in the rear of the transit shed is served by two railroad tracks and is made extra wide, 20-ft., in order to accommodate transhipment of automobiles to railroad cars and to give ample working room for the loading and discharging of railroad cars at the terminal. A 30-ft. roadway parallels the railroad tracks. Provision is made for a parallel row of warehouses, 100-ft. wide and 160-ft. deep, 16,000 sq. ft. to each compartment. The transfer between wharf and warehouse would be made by fast industrial trucks *via* ramps from wharf level to road level and road to warehouse floor.

It was decided by the City Council to construct only Transit Shed No. 1 at this time, with the anticipation that Transit Sheds Nos. 2 and 3 will be added as soon as the traffic movement has been firmly established.

The quay wall (1,200-ft. long) is set inshore 70-ft. from the natural shore line and the shore end of the west channel jetty. The construction was carried out in the dry by excavating a trench. The dock was dredged to 22-ft. after the dock wall was completed. The quay wall is of the high foundation relieving platform type.

Transit Sheds.

The transit sheds are of fabricated steel frame construction, steel frame windows, hollow tile and tapestry brick veneer walls, cast stone trim and architectural features with stucco walls for the second floor. The assembling of the building, as well as the interior fitting, was largely a routine matter and proceeded without incident. This is the advantage of using standardised structural steel frame and standardised hollow tile and brick construction for the walls. The beams of the second floor are standard " Holorib." The promenade verandah is mastic over " Holorib " roofing, and the roof is bituminous coated and insulated surface over steel roofing of " Holorib " design.

Gutters and down spouts are 6-in. diameter, of copper.

Transit shed doors are of the double horizontal sliding type, placed in alternate bays. They are 10-ft. wide by 14-ft. high to permit the use of crane attachments on electric industrial trucks.

It was found that the additional cost of brick and stone, with architectural treatment, was insignificant, compared with maintenance costs of corrugated metal or timber. This marine passenger terminal harmonises architecturally with the very handsome buildings of the Lake Shore Park recently constructed by the City of Rochester.

Passenger Deck.

In various ports of the world passengers are handled across the wharf on a travelling gantry gang plank to a second floor passenger gallery in order to keep passengers away from the freight handling activities of the main deck, where passengers are very much in the road and in personal danger. One of the best examples of this type of accommodation is that of the French Line at Le Havre, France; of the Saint Pauli Landing Stage at Hamburg; the Princes' Landing Stage at Liverpool; the stage at Tilbury; and the most recent development of this type is the Stazione Marittima, at Trieste, Italy. The coastwise vessels on the Atlantic Coast, Clyde Line, Savannah Line, Merchants and Miners, etc., handle their passengers through a suspended platform and gallery inside the shed and hung from the roof. Ticket checking windows are on the second floor at the street end of the floor. Car ferries can handle passengers only through the stern over the tracks or from the upper deck.

To afford accommodations for passengers, the second deck of Transit Shed No. 1 has a 20-ft. verandah the full length of the shed at the second storey level, and a second storey with a total floor area of 140-ft. by 100-ft., reached from the verandah through a 10-ft. wide double door and reached from the marginal street by a taxi curbing and pair of stairways to a bridge across the railroad tracks and car-loading platform. The lay-out of the passenger terminal accommodations includes large central main concourse and flanking offices to accommodate Customs and Immigration Inspectors' Offices; Immigration Detention Rooms, one for men and one for women, each with a wash-room and toilet; the offices for the Port Authority; and three offices with two ticket windows each for the steamship companies. Also a women's rest-room and a men's rest-room, with accompanying wash-rooms and toilets, are provided.

It is intended to extend the verandah by a 10-ft. bridge and promenade along the second floor of the two flanking Transit Sheds, No. 2 and No. 3, when these structures are built. This will make it possible at one time to dock four car ferries and passenger vessels of the usual 300-ft. length in use on the Great Lakes, in which case the passengers will walk along this open verandah, or terrace, to Customs Inspection Rooms or Ticket Offices.

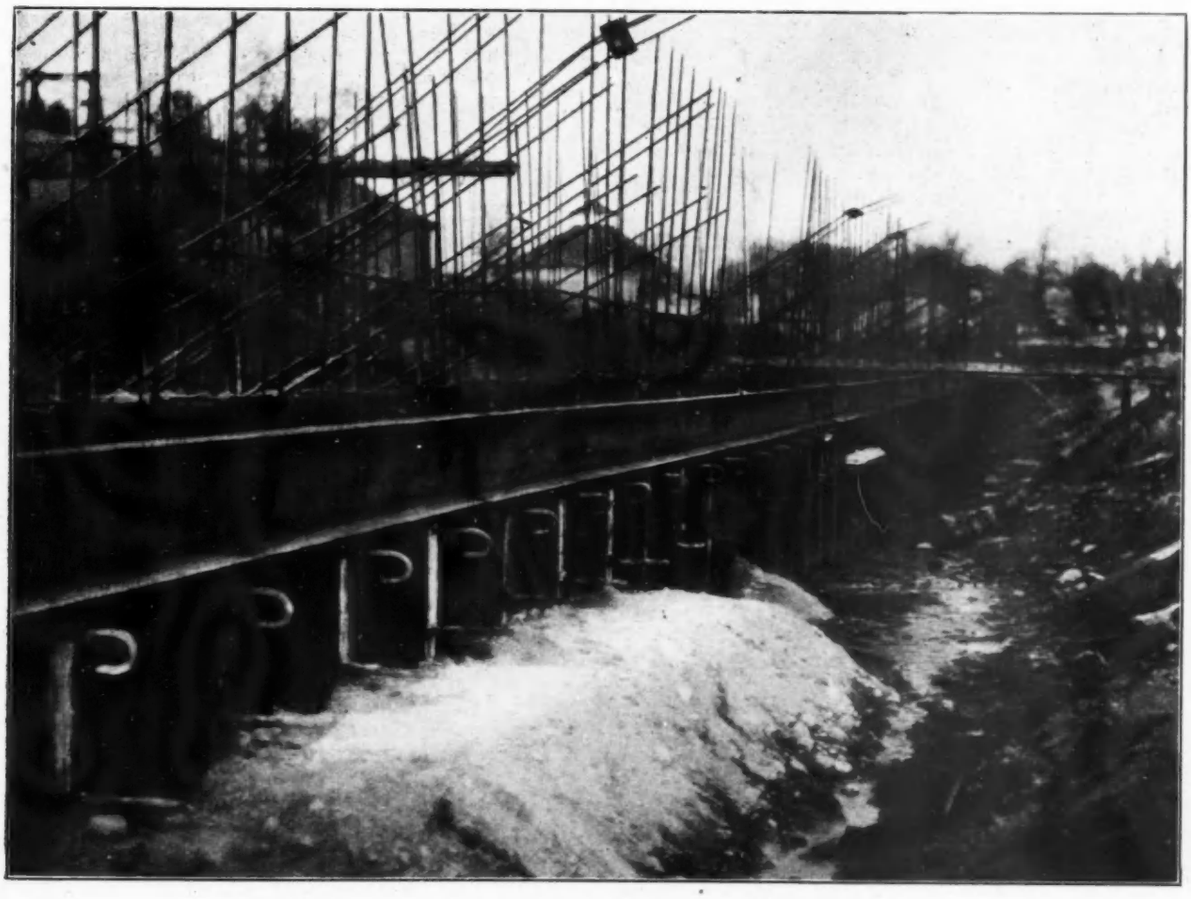
Gang plank from passenger deck—each rail section may be lifted out.

Mechanical Cargo Handling.

In view of the tendency toward mechanical handling of larger units in single lifts, the mechanical handling equipment was specified to consist of fast lift trucks, handling lifts of 3-ton capacity. These lift trucks will also have various attachments for special cargo, including attachments for handling newsprint paper, cranes for heavy lifts and tiering, dump bodies,

The Port of Rochester, New York, U.S.A.

Sand filled and graded to bottom level of horizontal relieving slab.



Sand to lower level concrete quay wall face—tie-back wales.

The Port of Rochester, New York—continued

and retrieving scoops for bulk commodities handled in piles on the floor. Much progress has been made in handling on the wharf by the use of fast electric truck cranes. By the old method the draft from ship's hold was broken down at ship-side and the pieces trucked by hand to point of rest on the wharf. About 18 men constituted the shore gang. The use of the fast crane truck requires only one man, the hooker-on, at the wharf end of ship's tackle. He unhooks the ship's fall and hooks on the crane truck, which moves the draft undisturbed to point of tiering in the shed or warehouse where the draft is deposited on top of the tiers of merchandise, all without breaking up the draft as it came from the ship's hold. Lightermen are no longer necessary. Crawler (caterpillar) transfer cranes for transfer between barge and shore, 65-ft. boom, are specified, or drafts loaded on to skids, two to three tons to the skid, will be placed on the wharf and then lifted by the industrial truck and moved to segregation point for sorting by marks and consignees, to railroad loading platform, to truck tailboard, or to storage point in the transit shed. Also fast crane trucks will lift the draft at ship-side and carry it to the stock pile on the wharf in the transit shed.

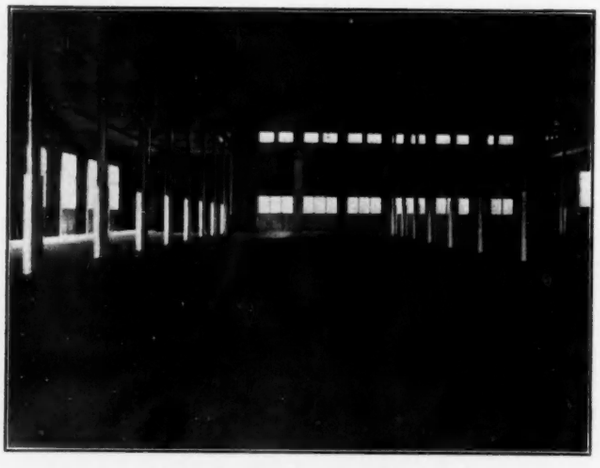
In addition to the cargo handling equipment, there were specified two electric capstans to assist in mooring and turning vessels and in shifting cars on the ship-side tracks.

Structural Design and Erection

Design and Construction of the Quay Wall.

The quay wall is of the high foundation relieving platform type resting upon a cut-off wall of deep arch interlocking sheet piling, 35-ft. long, modulus 15 cub. in. per lineal foot of wall, which penetrates at the upper end 3-ft. into the reinforced concrete dock wall. The face of the concrete wall extends 15-in. forward from the centre line of the sheet piling. The relieving platform or horizontal slab is carried on three rows of untreated timber piles measuring from the centre line of the sheet piling 2-ft., 5-ft. and 5-ft., the slab extending inshore 18-in. from the centre line of the inshore row of piles. These piles are 35 to 40-ft. in length. This relieving platform is 2-ft. thick. The bottom line of the platform is at datum plane 244-ft., which is 6-in. lower than the lowest known low water on record in Lake Ontario. This occurred in 1895-1896, the only times since records have been kept, beginning 1860. Lake level fluctuations are between plus 244.5-ft. to plus 248.5-ft. or 4-ft. The U.S. low water datum for harbour improvements is plus 244.5-ft.* It is essential that under no condition shall the tops of the piles be exposed above the water line or water table, otherwise the quay wall will develop pyorrhea.

The vertical wall is 3-ft. 6-in. wide with an angle joint 2-ft. wide by 2-ft. high in the angle of the vertical wall with the horizontal slab. It is reinforced by counterfort brackets 2-ft. wide on 12-ft. centres.



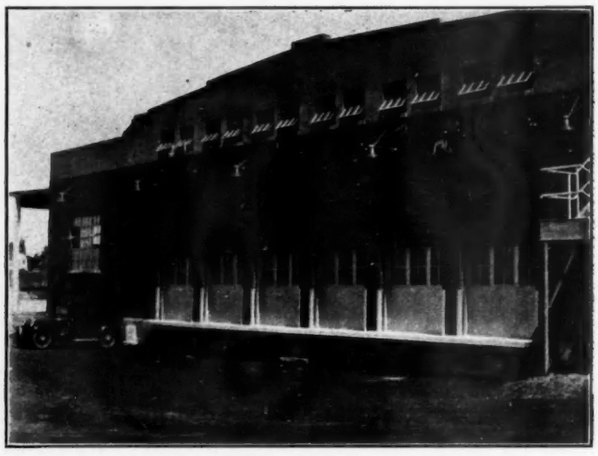
Interior freight floor of transit shed.

The wall is cast with expansion joints every 96-ft. The expansion joint is made by coating the surface of the tongue and groove concrete joints with hot asphalt and adding three layers of two-ply roofing paper with a coat of hot asphalt between each two layers of roofing paper. Three 2-in. steel rods in the vertical wall and one in the slab are anchored at one end in one section of the wall and extend into a sleeve in the concrete of the other section of the wall to maintain horizontal alignment between the sections. The sleeve is made by heavily greasing the iron bar and wrapping with paper. Expansion joints at those points where 96-ft. would fall within one of the drop gangway openings are extended to as much as 110-ft. between joints in one instance.

Mooring bollards of the double button type are located at convenient intervals varying from 48-ft. centres at the side port drop ends of the quay wall to 60-ft. centres for the straight wharf.

The inside edge of the vertical quay wall is depressed sufficiently to carry a light crane rail for the gantry gang plank, with the top of the rail flush with the top of the quay wall and the pavement of the wharf apron.

The face of the wharf is protected by two horizontal oak timbers the full length held by bolts with countersunk heads and anchored to rods cast in the concrete. Vessels are required to lower fender spars overside.



Six motor truck loading doors, vertical lift, at each end of the transit shed.

Tie-backs.

Before pouring the vertical wall the top edge of the steel sheet piling was reinforced with a horizontal wale as a seat for the nut on the end of a 2¼-in. anchor rod. This anchor rod is fitted with turn buckles just inshore from the inshore edge of the horizontal slab. The rods are anchored to sheet pile anchors by means of nuts, washers and a waling, or strong back, consisting of two 15-in., 35 lb., channel irons 15-ft. long. The anchors consist of 13 sections of interlocking steel sheet piling 14-ft. long driven on a line 50-ft. inshore from the vertical sheet piling of a dock wall. It was unnecessary to disturb the ground in front of the anchor sheet piling and dig out necessary pipe trenches for the tie rods and a trench back of the anchor sheet piling. Careful consolidation of the material back-fill around the anchor sheeting offers ample resistance to any outward thrust or tipping possibility of the wall, especially in view of the fact that this type of wall has practically the same inherent stability against overturning as a gravity wall.

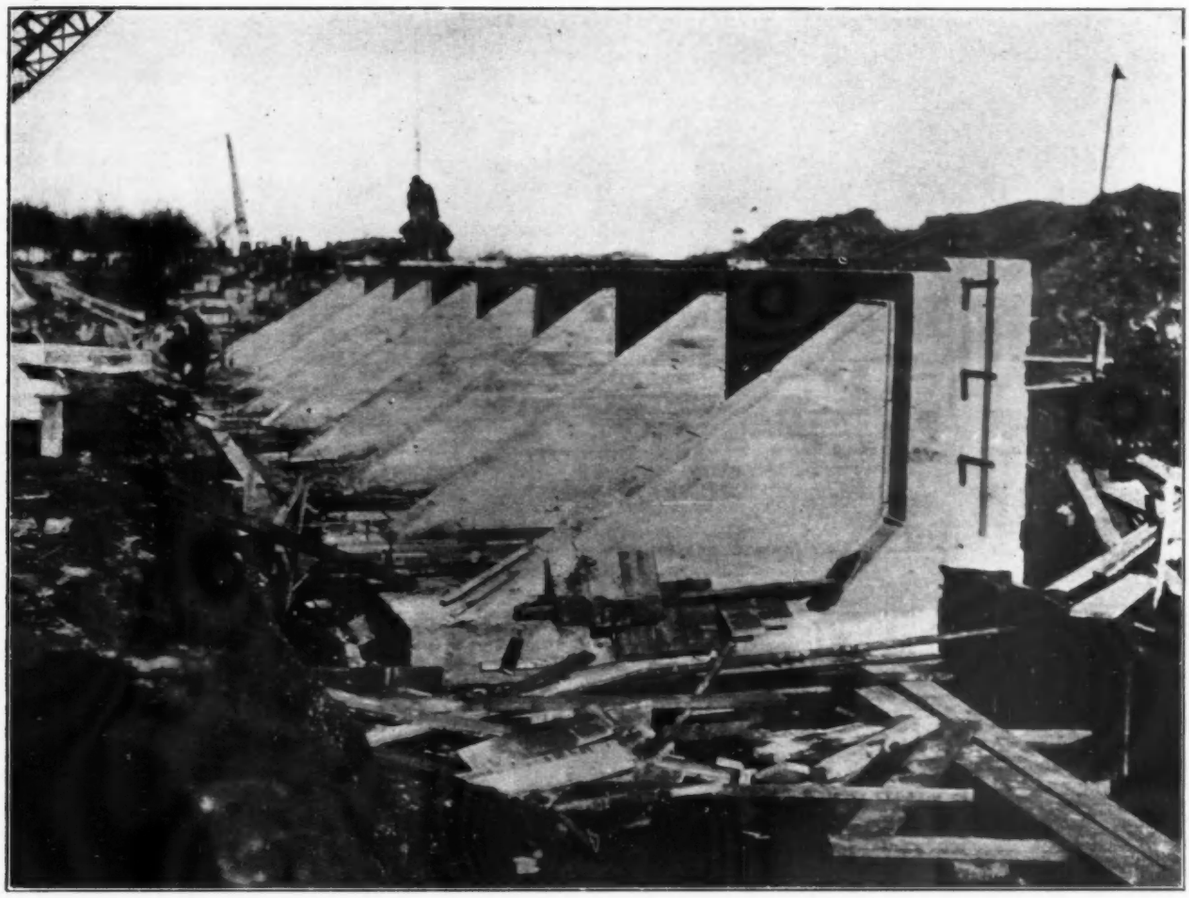
Methods of Construction.

The line of the wall was spaced 70-ft. back from the water's edge of the river—for three reasons: (1) to provide a berth out of range of any seas coming through the open mouth of the jetties with the wind from that direction; (2) to afford a wider turning basin in the mouth of the river; and (3) to afford an opportunity of constructing the quay wall in the dry.

The progress photographs clearly indicate the steps in the construction of the wall. The excavator dug a trench approximately 6-ft. wide at the bottom with sloping banks to provide for the driving of the steel sheet piling and the first row of wooden piles. Then followed, after the sheet piling was driven, the excavation of the trench to approximately 18-ft. wide at the bottom and the second and third rows of wooden bearing piles were driven. The wall was built up in sections after pumping seepage water from the trench. The ground was filled to plus 244-ft. at bottom level of the slab and the inshore end and forms and the reinforcing rods for the horizontal slab were placed and the concrete poured. The connecting rods to the reinforcing rods of the counterforts and the vertical wall were allowed to project. The reinforcing rods were then placed for the vertical wall and for the counterforts, the forms placed and the concrete poured. Before the pouring of the vertical wall the tie-back rods and walings were put in position and anchored to the tie-back sheeting. Also the outside trench was filled with sand and smoothed to the level of the bottom edge of the concrete to act as the bottom of the form in pouring the vertical wall. The wall was then back-filled to 1-ft. below wall level and is being allowed to consolidate without the paving of the 30-ft. wide wharf apron for a year or two, in order to permit a complete consolidation of the fill. There was then added

*Datum and mean water level at New York.

The Port of Rochester, New York, U.S.A.



Quay wall poured before back filling, mooring bits being placed—note locks in expansion joints

Completed Terminal—two-way travelling gantry passenger gang plank in position.

The Port of Rochester, New York—continued

cinder fill 1-ft. deep and a temporary two-ply timber deck. The railroad tracks are set on ties resting directly on the cinder fill, the deck being flush with the rail tops and the only groove being that necessary for the flange of the car wheel. It is anticipated that within two years the complete consolidation of the back fill will permit laying a 9-in. reinforced concrete slab over the wharf apron and railroad ties. Ties are creosoted.

The transit shed columns rest upon concrete spread footings. Due to the varied nature of the subsoil, these concrete footings are of various depths and areas as the individual location dictated.

At the south end of the quay wall there are approximately 40-ft. of sheet piling without a concrete cap which ties into the embankment of the New York Central Ontario Branch at the approach to the drawbridge. This junction with the piers of the drawbridge is armoured with heavy rock to prevent scour and any tendency of the river waters and spring freshets reaching the back of the tying-in curtain wall. The water in front of this tie-in wall is not dredged to full depth beyond the toe of the natural angle of repose of the railway embankment.

Channel Depths.

With the opening of navigation in the Spring, the ships' berths in the front of the quay wall were excavated to −21-ft. Due to the fact that depths of channel greater than 22-ft. were not visualised when the channel jetties were constructed by the United States Government, it would be unsafe to deepen the channel to more than −22-ft. for fear of upsetting the jetties. The Corps of Engineers, U.S.A., put powerful dredges to work in 1932 to increase the depth of the harbour channels from 18 to 22-ft. and to widen the entrance channel from 150 to 200-ft. between jetties corresponding with the channel width lakeward from the ends of the jetties. Although the new standard depth of connecting channels of the Great Lakes is 25-ft., and the St. Lawrence Seaway 27-ft., the Charlotte Terminals are limited to 22-ft. This depth will accommodate passenger-package freight vessels plying the Lakes, car ferries and canal-lake barges. The future deep harbour anticipating the St. Lawrence Seaway Ship Channel of the future is located in deep Irondequoit Bay, to the east, now undeveloped for ships.

Report of Corps of Engineers, U.S.A., 1930, page 1632, reads as follows: " The project depth is referred to low water datum for Lake Ontario, elevation 224.5-ft. above mean tide at New York, 2-ft. below mean Lake level 1860-1875. This depth corresponds to depth 18.5-ft. on the Lake Survey Chart 241. Ordinary fluctuations of the water surface are from 4-ft. above to low water datum. Fluctuations due to winds are small."

The request before the Corps of Engineers also includes the dredging of the turning basin in front of this municipal public terminal. This turning basin with a small cove on city property on the east side of the river would give a total turning width of 730-ft. from the face of the quay wall to the mooring dolphins at the east side of this turning basin. The turning basin was dredged to a diameter of 550-ft. in 1932.

A sum of $500,000 was appropriated by the City Council of the City of Rochester, and contracts were let for the work.

The construction by law was under the Department of Public Works—to January 1st, 1932: Harold Baker, C.E., Commissioner; William H. Roberts, engineer in immediate charge. Since January 2nd: Arthur C. Poole, City Manager, and John G. Ellendt, Commissioner of Public Works. R. S. MacElwee, of MacElwee and Associates, Inc., consulting engineers, was the supervising consulting engineer.

The passenger and package freight terminals at Charlotte embody the most modern features for this type of terminal developed on the Great Lakes to date.

This initial unit of the Port of Rochester does not meet the needs for a great industrial and bulk cargo harbour to accommodate vessels of large dimensions now having access to Lake Ontario through the Welland Canal, nor the larger of the ocean vessels expected through the canalised St. Lawrence. The full report covering the large ship harbour location and equipment was submitted by MacElwee and Associates, Inc., to the Monroe County City Commission of Rochester on March 11, 1932, gives a comprehensive plan for such a development in Irondequoit Bay.

All Photographs in this Article are by the Author.

Lloyd's Register Shipbuilding Returns for Quarter ended 30th September, 1932

From the statistics issued by Lloyd's Register of Shipping regarding vessels under construction at the end of September, in Great Britain and Ireland there is a further decrease of 42,259 tons in the work in hand as compared with the very low figure for last June, and the present total—238,433 tons—is 178,952 tons less than the tonnage which was being built at the end of September, 1931. The figure for September, 1932, includes about 150,000 tons on which work has been suspended—126,000 tons of steamers and 24,000 tons of motorships. The present total of 238,433 tons is lower than any figure hitherto recorded by Lloyd's Register.

Nearly 74,000 tons—representing 31 per cent. of the tonnage now in hand in this country—are intended for registration abroad or for sale.

The tonnage now under construction abroad—662,634 tons—is about 166,000 tons less than the work which was in hand at the end of June, 1932, and is the lowest recorded since the beginning of 1911. Tonnage, included in this figure, on which work has been suspended amounts only to 3,680 tons of steamers and 19,232 tons of motorships.

The five leading countries are: Italy, 127,969 tons; United States of America, 124,703 tons; France, 109,285 tons; Germany, 80,770 tons, and Sweden, 73,480 tons.

The total tonnage under construction in the world amounts to 901,067 tons, of which 26½ per cent. is being built in Great Britain and Ireland and 73½ per cent. abroad.

In Great Britain and Ireland only 10,837 tons were commenced during the last three months—the lowest figures on record, and 47,884 tons were launched, this figure showing a decrease of 11,371 tons as compared with the June quarter. Similar figures for abroad are 32,572 tons commenced, and 140,324 tons launched, showing a decrease, as compared with the previous quarter, of 10,000 tons in the tonnage commenced, while there has been an increase of 15,000 tons in the tonnage launched.

The oil tankers under construction in the world amount to 28 vessels of 215,240 tons, of which 5 vessels of 38,216 tons are being built in Great Britain and Ireland, 9 vessels of 60,200 tons in Sweden, and 4 of 49,600 tons in Germany. Motorships account for over 92 per cent. of the total tanker tonnage under construction.

The tanker tonnage now in hand comprises nearly 24 per cent. of the total steam and motor tonnage being built in the world.

Of the 238,433 tons under construction in Great Britain and Ireland at the end of September, only 24,984 tons consisted of motorships, while the motorship tonnage being constructed abroad at the same date (385,060 tons) was 107,486 tons in excess of that of the steamers.

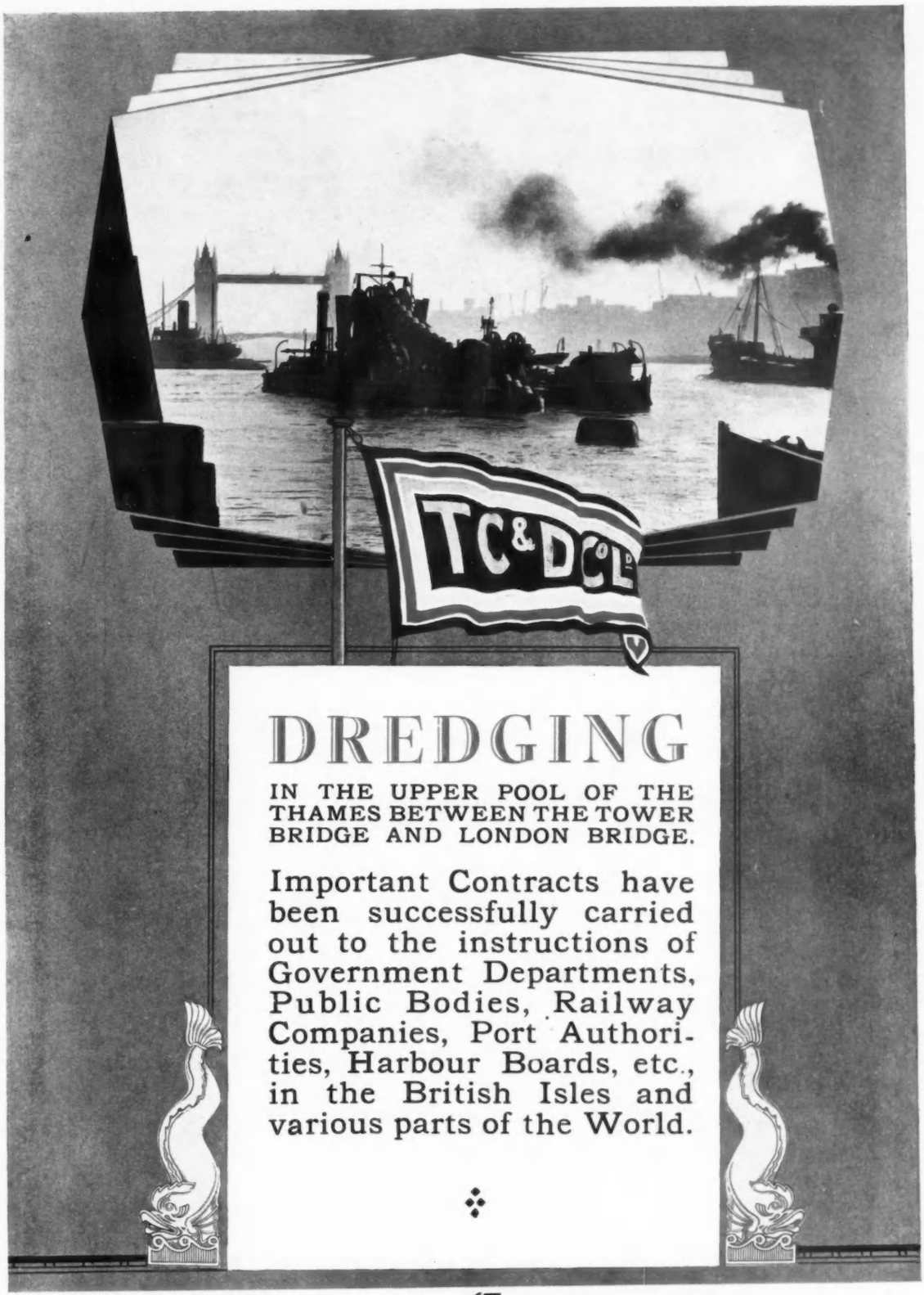
Of the vessels being built in the world at the end of September there are 2 steamers and 8 motorships of between 8,000 and 10,000 tons; 5 steamers and 12 motorships of between 10,000 and 20,000 tons; and 5 steamers and no motorships of 20,000 tons and upwards.

The table respecting marine engines shows that the horse-power of steam engines now being built or being fitted on board amounts to about 746,000 h.p.; these figures include 20 sets of turbine engines of about 649,000 shaft horse-power, giving an average of 32,400 h.p. per set. The horse-power of the steam reciprocating engines (about 97,000 h.p.) is under 10 per cent. of the total horse-power of marine engines now building in the world. The figures for oil engines aggregate about 355,000 h.p.

Tonnage to Lloyd's Register Class.—Although severely affected by the unprecedented reduction in the total amount of work in hand throughout the world, the tonnage being built under the inspection of Lloyd's Register at the end of September still reaches over half a million tons, viz., 222,679 tons under construction in Great Britain and Ireland, and 283,563 tons abroad.

A Record Achievement at Grimsby

One of the 35-ton gates at the lock pit of the Grimsby Fish Dock was recently damaged, and on being lifted clear of the water it was found that there would have to be a metal casting designed to replace the broken heel pivot, and it was thought that this would take some five or six weeks. The casting, however, reached Grimsby in a week, and was fixed to the gate in less than a day. On Sunday, October 30th, the repaired gate was lifted, taken into the lock pit, and lowered into position, the whole operation of moving, placing and securing taking less than an hour, which constitutes a record for the port.



DREDGING

IN THE UPPER POOL OF THE THAMES BETWEEN THE TOWER BRIDGE AND LONDON BRIDGE.

Important Contracts have been successfully carried out to the instructions of Government Departments, Public Bodies, Railway Companies, Port Authorities, Harbour Boards, etc., in the British Isles and various parts of the World.

Tilbury Contracting & Dredging Co Ltd

ESTABLISHED 1884

TILBURY HOUSE, Petty France, LONDON, S.W.1

Irish Harbour Matters

Dublin

Dublin Port and Docks Board.

AT the meeting of the Dublin Port and Docks Board, held on October 20th, it was agreed by a majority to accept the offer of the James Dredging, Towage and Transport Co., Ltd., who said that in part payment for the tug " Foremost 84 " they would take the Board's tug " Majestic," reducing cash payment to £11,000.

The Lord Mayor (Alderman A. Byrne, T.D.) objected to the proposal and said that the money should be spent giving employment locally.

The Chairman (Mr. W. Baird) said that while on general principles he agreed with the Lord Mayor, the builders of the tug were not only offering this tug, but were taking from the Board an obsolete vessel and paying £2,500 for it. Otherwise they would not get £100 for it. In addition, the Government were anxious to get the boat built in Dublin and ready to subsidise it to the extent of £2,000. The difference was still great between the prices at which the boat could be built, Dublin Dockyard having offered to do the work at £15,000. At present they had only one tug, and if a large ship came into harbour they would need two.

Mr. Wallace remarked that they had two dockyards in Dublin, one controlled by Irish directors and another by English directors. Why was the work offered only to the English controlled company? It was disgraceful, he said, to ignore the Irish company altogether.

The Chairman said it was of paramount importance that labour should be employed as soon as possible.

When the Chairman moved the adoption of the report, the Lord Mayor declared that seven-eighths of the work could be done without the tug. It was a disgrace to the Dublin Board while men were standing idle at North Wall.

The Chairman and Mr. D. Barry both denied the suggestion that the tug to be purchased was second-hand.

The New Tug: " Foremost 84."

The tug in dispute at this meeting has since been delivered at the Alexandra Basin, Dublin, where the vessel was boarded by Capt. Webb, Harbour Master; Mr. E. H. Bailey, Secretary; and other officials of the Dublin Port and Docks Board, who made a tour of inspection and expressed their satisfaction with this addition to the equipment of the port.

Built by Messrs. Scott and Sons, of Bowling, " Foremost 84 " was registered in London on August 1st last. She measures 105-ft. in length with a beam of 27-ft., and her gross tonnage is 227; she carries a crew of eight. She was brought to her home port by Capt. Twohig, assistant harbour master, assisted by Capt. Diggins, who has been appointed master of the tug.

On her steam trials the " Foremost 84 " averaged 12 knots. During her passage from the Clyde she experienced heavy weather, and proved her sea-going qualities satisfactorily. She is fitted with the latest steering gear, has powerful engines and a modern steam capstan for towing purposes. This tug burnt only seven tons of coal during her run of 190 miles from Bowling. She has well-appointed saloons and quarters for the master and crew, the master's quarters being fitted with mahogany. The bathroom, pantries and stores have tiled floors, and the structure of the vessel generally is very complete. The lifeboats are of steel.

Cork

Cork Harbour Board Chairman.

Mr. R. Wallace has been re-elected Chairman of the Cork Harbour Board for the fourth year in succession. Returning thanks for the Board's confidence in him, Mr. Wallace said that the port was growing steadily. At present there might be pessimism in connection with the national policy of their country, but he was optimistic enough to believe that all would come right.

The Pilotage Committee was re-elected as previously constituted, with Capt. J. Collins as chairman.

Galway

Galway's Ambition.

Interest has again been revived in the proposal to establish a terminal trans-Atlantic port at Furbough, Galway, with an air liner service to Great Britain and Europe, by the visit of a party from London in connection with the matter.

To build a deep water dock at Furbough with an international air port alongside, a sum of £2,500,000 would be required. Furbough is within 2,196 nautical miles of Halifax, as against 3,246 nautical miles between Southampton and New York.

The plans for the deep water dock at Furbough have been submitted by Sir John Purser Griffith, and after full investigation they have been approved by Mr. Maxwell Ayrton, F.R.I.B.A.

The plans for the new airport will be submitted by Sir John Griffith before they are finally decided upon.

The party which visited Galway in connection with the project was made up as follows: Mr. B. J. Allison, M.I.M.E., joint managing director of Messrs. K. L. Kalis and Co., the Anglo-Dutch dredging and reclamation firm, of Stone House, Bishopsgate; Mr. Maxwell Ayrton, F.R.I.B.A., the architect of Wembley and Philadelphia Exhibitions; Mr. Laidlaw Smith, Mr. Cooke, A.M.I.C.E., a joint director with Mr. Smith of Messrs. Smith, Walker, Ltd., constructional engineers, Westminster; and Mr. John Griffith, C.E., who represented Sir John Purser Griffith, who was unable to travel from Dublin.

Drogheda

Drogheda's Coal Trade.

A new double hopper coal screen and shoot has been erected on the Drogheda Quay beside the coal depôt of Messrs. McGee. This is a steel structure which receives the coal from the crane bucket, extracts the slack from it and shoots the screened coal into one lorry and the slack into another. It is capable of screening and loading about 280 tons of coal per day, and was specially designed to suit conditions of discharge in Drogheda. The machine was formally started on its first job by Alderman J. Dowd, Mayor of Drogheda.

Wexford

Wexford Harbour Survey.

With the view of ascertaining the possibility of improving Wexford Harbour, the Harbour Board have had a complete survey made of the harbour and its approaches.

The survey was made by Messrs. R. B. Grantham and Son, who stated in their report that, in order to preserve the navigation of the harbour from final extinction, it will be necessary to concentrate as much as possible of the energy of the ebb and the flood streams of the harbour lagoon within a single well-defined channel from Wexford town to deep water at sea.

They proposed to effect such concentration by the construction of more or less parallel training walls, so erected that, while they would not offer obstruction to the influx of the flood tide into the area of the lagoon, they would ensure that the maximum energy of the ebb, supplemented by the waters of the River Slaney, was no longer dissipated in seeking means of egress, but was concentrated within defined limits from the existing training walls below the harbour quay to deep water at sea.

They estimated that the construction of a trained channel such as they recommended, and its deepening to a minimum depth of 14-ft. at low water ordinary spring tides, would cost about £86,000. This estimate was, however, subject to revision on closer investigation of details than they had yet been asked to undertake.

It was decided to write to Mr. Clayton, principal of Messrs. Grantham and Sons, to confer with representatives of the Board.

Immingham Dock Statistics.

During the month of October a total of 138 vessels, representing a net registered tonnage of 145,127 used Immingham Dock, including 18 vessels totalling 21,327 net registered tons using the Western Jetty coaling berth; as compared with October, 1931, when the same number of vessels, totalling 168,355 net registered tons, used the port, including 22 vessels totalling 38,075 net registered tons using the Western Jetty.

Collapse of Dock Crane.

On the south side of No. 6 Dock, Manchester, a hydraulic crane collapsed on November 14th, the 40-ft. jib being smashed across the forecastle head of a ship that was discharging at the time. Some damage was done to the forecastle. The crane, registered to raise 25 cwt., was engaged in lifting six bales of pulp, the estimated weight of which was between 22 and 23 cwts. On coming in contact with the ship the jib broke in two. The accident happened in the evening and workmen of the docks staff were drafted to the spot to clear the debris in order that the crane might be replaced by the following morning and the work of discharging the cargo continued.

The Problem of Port Costs*

By Sir DAVID J. OWEN

ONE of the duties imposed upon the President of this Institute is to deliver an address at the commencement of his year of office, and I imagine there is a necessary implication that that address should, as far as possible, be of some general interest to the various forms of transport embraced in the wide scope of the activities of the Institute. I therefore make no apology for presenting to you some considerations in relation to the subject with which I am most familiar, viz., Ports.

The significance of a port from the point of view of transport lies simply in the fact that it is the junction between sea and land—in other words, a point at which one form of transport is changed for another. On sea we have virtually only one means of transport—the ship; on land, the continuance of the chain of transport may be by railway, road or inland waterway. Thus ports, while obviously of vital interest to the shipping industry, are not matters of unimportance to railway companies, road hauliers and canal proprietors.

The importance of ports to the whole of the community in a maritime country like ours need not be emphasised. We get some idea of it when we look at the volume of the shipping tonnage entering and leaving the ports of the United Kingdom annually. In the year 1931 it amounted in net registered tons to 339,021,611. It may be remarked that nearly one-sixth of this total tonnage used the Port of London—Liverpool coming a good second. London and Liverpool between them account for over one-fourth of the whole shipping arrivals and departures of the Kingdom. If we take about twenty of the chief ports of this country, we find that they accommodate 75 per cent. of the shipping of the Kingdom, the balance being spread over a large number of small ports.

If we turn to the goods imported and exported at our ports, we find our particulars incomplete. There are no available figures of the weight of all such goods, but we have values of the oversea trade only. Last year the total value of the imports and exports of merchandise (other than transhipments under bond) from and to foreign countries and British possessions was £1,315,743,000, and it is interesting to observe that London's share alone was over one-third of the whole (the actual figure being 37.4 per cent.), Liverpool coming next. London and Liverpool together dealt with over one-half of the whole imports and exports—in terms of values—and half-a-dozen of the largest ports accounted for three-quarters of the whole. In these figures the value of the extensive coastwise trade is not included.

A port, not being in itself a means of conveyance or transport but only a facility or accommodation for the actual instruments of transport, must—in order to serve its purpose effectively—adapt itself to changing conditions in the means of transport. If it does not, then its trade may leave it for more suitable places, or, if this is not possible, the result will be a handicapping of trade by increased costs and delays. I use the phrase "if this is not possible" advisedly, because the port as a link in the chain of transport is an enormously costly one to provide, and new ports cannot spring up elsewhere easily or quickly.

I propose in this address to draw attention to various factors which affect costs at ports. Those responsible for the administration and management of ports not infrequently receive complaints from individuals and official bodies that the expenses incurred by vessels and goods at those ports are too heavy and comparisons are made between different ports in this country and often between ports in this country and those on the Continent. The matter also periodically finds a place in the columns of the newspapers.

It must be borne in mind that when a shipowner speaks of costs at a port he is not referring solely to the charges made by the Port Authority but to all the expenses he has to incur, these including light dues payable to the Government; river, harbour and dock dues payable to the Dock or Harbour Authority; pilotage; towage; wages of labour for discharging, loading and tallying the cargo, which labour may be in his own service or may be employed by a stevedore or by the Port Authority; and the charges for the use of cranes and other gear. Customs vary at different ports. Some port authorities are also the pilotage authority; some undertake the operations of loading and discharging vessels; some, while exercising control over the charges, do not actually perform the stevedoring work, while others are not in any way concerned with that work. A port authority is therefore unable itself to say what is the total actual amount of costs incurred by a vessel at its port. The shipowner alone knows. I have, however, been able to ascertain shipowners' exact costs incurred recently in respect of certain vessels at several ports, and I quote some instances of the total expenses worked out at a cost per ton of cargo.

Port	Net register tonnage of vessel	Weight of cargo	Total cost per ton of cargo s. d.
British	4,511	2,990	5 6
,, ...	4,511	2,969	5 1½
,, ...	3,517	3,533	4 3½
,, ...	3,517	2,582	4 8½
,, ...	4,426	1,952	9 1
,, ...	4,426	1,450	6 9
Continental	4,426	5,066	3 5
British	4,731	2,587	7 11½
,, ...	4,731	1,997	4 5
Continental	4,461	3,208	3 5½

From the point of view of costs, it is not necessary for me to enter very much into the question of the constitution of the bodies which control the ports of this country. As will be known, these bodies vary, there being no standardised system. Most of the large ports are controlled by public trusts, while others are under municipalities, railway companies, canal companies and private companies. It appears on the face of it to be a confused state of affairs, but few institutions in this land can be described as ideal or based upon logical considerations—tradition and worn-out customs playing a large part in our life. The English people are prone to worship antiquity, sometimes to the detriment of efficiency.

The principal factors which account for the variation in costs between one port and another can be dealt with under a few broad headings.

Capital Expenditure.

First of all, we may take the extent of the capital expenditure involved in the provision of the accommodation required, such as docks, quays, sheds, etc., and the annual charges arising out of that capital expenditure. Such expenditure in ports, as in many other undertakings, is considerable.

The capital expenditure at the under-named ports stands at the following approximate figures, viz.:—

	£
London	39,950,000
Liverpool	43,470,000
Bristol	8,750,000
Glasgow	12,050,000
Belfast	3,580,000
Leith	3,600,000

There have been many more millions spent in the other ports, apart from those under the control of the four big railway companies which, it would appear, have together sunk something over £66,000,000 in docks, harbours and wharves. A few instances are given in round figures of the percentage which the interest and sinking fund charges bear to the total expenditure:

	Per cent.
London	28
Liverpool	50
Bristol	40
Glasgow	46

These percentages are in relation to the total expenditure and, as at some ports, such as Liverpool, only a comparatively small expenditure is incurred on labour for the handling of goods, the proportion of the capital charges to the total expenditure is greater at that place than at ports such as London, where the port authority's expenditure is accordingly high.

The amount of the capital expenditure depends upon the character and the extent of the accommodation required, and it is in respect of the character of the accommodation that we find great differences between ports. In a port used by large vessels the depth of water in the channel leading to the port and of the water in the docks or at the wharves must necessarily be greater than that at a port frequented by small vessels. It must be borne in mind that in the work of dredging and constructing dock walls and wharves the cost increases at a greater ratio the deeper they go; for instance, the cost of constructing a dock wall 40-ft. deep is not twice that of a 20-ft. wall but four times that cost.

*Inaugural address given by Sir David J. Owen, President of The Institute of Transport, on October 10th, 1932, and published by kind permission of The Institute of Transport.

The Problem of Port Costs—*continued*

The range of tide is an important factor in determining the capital expenditure necessary at a port. It is not a provision of nature that the tide shall rise and fall to the same extent everywhere. The average differences in height between the level of low water and that of high water at the following ports, for instance, are :—

Port	Neap tides feet	Spring tides feet
London	15¾	21½
Liverpool	15¼	27
Bristol (Avonmouth)	21½	40
Hull	16¼	20¾
Glasgow	10½	12½
Belfast	6½	9½
Antwerp	12	16
Hamburg	5½	6¼
Rotterdam	5	6

If the range of tide is not very great, a vessel can lie at a dock or wharf and rise or fall with the tide without much inconvenience to the operations of discharging or loading, but if the range is large it is practically impossible to do this, and it then becomes necessary to provide an entirely different sort of accommodation in the form of enclosed docks in which the water is retained at practically one level, and to which ships can only get access by means of locks. The construction of a lock entrance is a most expensive matter, as will be seen from the figure of £1,600,000, which was the cost of the most recently constructed lock in the Port of London. A rough estimate of the capital expended in locks in London is £5,100,000, and at Liverpool it is also over £5,000,000.

It will be noted that at Hamburg and Rotterdam the range of tide is only a few feet and the result is that at both of those ports ships are accommodated in open havens or docks having no lock entrances. Nature has therefore imposed an annual burden of nearly £400,000 (which is the cost of interest on capital and of working and maintaining the locks) on the shipping of London and of a similarly large amount on the vessels using Liverpool, which burdens are absent in such ports as Hamburg and Rotterdam. This burden of £400,000 in London represents about sixpence per net register ton of shipping using the docks in that port. It is clearly one of the factors which makes for cheapness in the Continental ports.

Nature of Trade at Ports.

The costs incurred at ports depend also on the nature of the trade of the port. A few illustrations will indicate what I mean in this respect. At a port where coal is the principal commodity exported, transit sheds and warehouses are very little needed, but, on the other hand, special mechanical appliances with extensive railway sidings are required; where vessels mostly discharge or load bulk cargoes of grain, ore, etc., direct overside into or from barges, quayage facilities are not called for to any great extent; but where cargoes of miscellaneous articles of great variety are dealt with, then extensive quays and transit sheds are necessary, with the addition of capacious warehouses where the nature of the trade necessitates more or less lengthy storage of the goods.

A glance at the character of the imports and exports of a few ports will give an indication of the extent of the expenditure that has been necessary to provide the port accommodation. For example, in Rotterdam, such articles as coal, ore, grain, oil and timber—which come largely in full cargoes—constitute over 80 per cent. of the trade, while in Hamburg similar goods account for 60 per cent. of the total imports and exports. On the other hand, London, Liverpool and many other British ports are not bulk cargo ports. An analysis of the principal commodities imported and exported at London gives the following result :—

Commodity	Tonnage	Per cent of total
Coal	10,105,430	29.7
Grain, etc., in bulk and in bags ...	3,304,177	9.7
Petroleum, oil and spirit ...	3,088,372	9.1
Timber	1,165,579	3.4
Other goods	16,388,384	48.1
	34,051,942	100.0

It is clear that proportionately many more vessels with full cargoes of easily handled commodities use the large Continental ports than the Ports of London and Liverpool, with the result that less extensive and less expensive accommodation for ships is required at the former ports, while the cost of handling the goods is cheaper. To mention specially the case of London, the imports and exports consist largely of miscellaneous goods packed in vast numbers of cases and bags of varying dimensions. In one instance of a general cargo imported by a vessel into London recently, the total weight of the cargo was 4,100 tons, made up of over 157,000 packages of different sizes, and this is not an uncommon case.

At the Continental ports the transhipment of bulk cargoes into large barges (many up to 3,000 tons capacity) which proceed through the rivers and inland waterways of Europe, is an important factor. It enables mechanical equipment to be used with greater effect than is possible, for instance, on the Thames, where the problem of navigation, the comparatively attenuated nature of the waterways and the character of the trade permit of the use of barges normally of only about 200 tons capacity. It is obvious that the discharge of grain in bulk into a 3,000-ton barge permits of a straight and uninterrupted run of work to that extent, but the same quantity discharged into barges in London, even if it were discharged in bulk, would necessitate the use of at least 15 barges, the changing of the barges, the moving away of the loaded barges and the bringing of the unloaded barges into position, all adding to the time taken to discharge the ship and minimising the value of the grain discharging appliances.

I was much interested a little while ago to note that, in the discussion which took place on a paper read before the Institute in January last by Mr. Ross-Johnson, Mr. C. E. R. Sherrington referred to this question of the enormous barge traffic at one of the Continental ports; he said " for instance, in comparing the Port of London with the Port of Hamburg, one is hardly comparing like with like. Hamburg is a river transit port . . . . and ships' cargoes are not mainly discharged on to the quays but into smaller vessels for final discharge at, say, Dresden; hence to compare with London one must add the costs involved at Dresden to those incurred at Hamburg "; he added: " above all, British trade as at Liverpool or London is retail in nature; at Hamburg, Rotterdam and Antwerp it is largely wholesale; in fact, the latter are in reality transit ports." These words very clearly explain the position.

Machinery.

After dealing with the nature of the trade of ports, it will be in natural sequence to refer to mechanical appliances. It has been stated that one of the drawbacks of our country's ports is the lack of such appliances for the cheap handling of goods. In evidence given before the Royal Commission on Transport in 1929 it was said that, speaking generally, the big ports in this country had kept pace with modern requirements as regards new docks and quays, railway and road facilities at the quays, appliances and general lay-out, but that manufacturers, traders and shipowners were seriously handicapped in competition with other countries both as regards the speed and cost at which the ships and their cargoes were handled; further, that the additional labour-aiding equipment and machinery that have been provided in recent years are neither being used to their full extent nor at the minimum of cost. It was suggested that in our ports we have not accepted the " machine age "—at any rate that, although there had been an immense outlay of money on machinery, we were not getting any advantage from it commensurate with the expenditure. I know from personal observation that there are no special appliances in use at Continental ports that are not known and employed fully in most British ports. In fact, it is doubtful if such appliances as lifting cranes, etc., are used at foreign ports to anything like the same degree as, for instance, at London and Liverpool. Grain elevating plant is used to a large extent at one or two Continental ports, as is natural when it is borne in mind that grain is one of the most extensive in volume of the commodities handled there. London, Liverpool and other British ports, however, are fully equipped in this respect to deal with the grain going to those ports in the conditions which apply to the delivery of the grain.

This matter of machinery is frequently stressed. I have not full particulars of the number of mechanical and other appliances which may be described as labour-aiding at all the ports in this country, but it may be of interest to give an idea of the extent to which such appliances are in use in the docks of London where the port authority never hesitates to introduce machinery of proved utility to aid labour, to expedite and increase output of work and cheapen costs. It also never hesitates to experiment with machinery in order to test whether it will prove useful and economical.

The Port of London Authority owns 1,323 cranes for use at the dock quays, sheds and warehouses, with lifting capacities ranging up to 25 tons, 4 floating cranes lifting up to 50 tons, and one with a capacity of 150 tons. There are 72 electric runabout trucks for conveying goods to and from the quays and the sheds and warehouses; 220 lifts for dealing with goods for storage; 21 grain elevators; and numerous systems of conveyors for handling special commodities such as frozen and chilled meat, bananas and wool. These figures do not include the mechanical appliances which have been installed by private individuals for the handling of goods at the many wharves on the banks of the Thames.

The intensity of the cranage at the docks used for general cargoes in the Port of London will be appreciated when it is stated that there is an average of one quay crane (apart from other cranes) for every 54 yards of lineal quayage. While this is an average over the whole quayage, it will be realised that

The Problem of Port Costs—continued

at some places very few cranes are required, while at others there are as many as eight cranes at each ship's berth. It may be noted that certain shipowners prefer to discharge their cargoes by means of their own ship's gear, and do not use the quay cranes provided, while other shipowners use the cranes provided for them to handle such a small proportion of the total cargo discharged from and loaded into the vessels that the use of those cranes is an uneconomic one. As a matter of fact, during last year the quay cranes in the Authority's docks were used during only 23 per cent. of the ordinary working hours. The cry for more machinery frequently comes from people who do not appreciate that mere machinery is not the solution of all problems relating to costs of handling. It is a very elementary thing to say that the use of no machine can be justified economically unless it can be so worked that the result will be the handling of the goods at a less expense per ton than by merely manual labour. The machine was made for man and not man for the machine.

What is apt to be forgotten is that for the handling of general cargoes such as I have already alluded to, consisting of goods packed in cases and bags of varying dimensions, the only appliances of any use are cranes, sometimes roller runways, in certain cases electric trucks, and ordinary hand trucks, the last-named of which cannot be beaten for many purposes. This is the experience throughout the world. I have visited many ports in the United States of America for the purpose of studying this problem, and have found there, where human ingenuity has gone to great lengths in mechanical appliances, generally an absence of such appliances for the handling of general merchandise on the quays, the work of discharging and loading vessels being mostly left to the ship's own gear. There is nothing in the United States to compare with the enormous number of quay cranes in most British ports. It is true that for the handling of articles in bulk, e.g., grain, ore, coal, sulphur, limestone, and so on, there is an abundance of up-to-date plant of a special and expensive character. Although the machines are so costly to construct, the goods dealt with by them are of such vast volume that the cost of operating per ton is small. It was, however, borne in very strongly upon me that for the handling of miscellaneous cargoes the only appliances available were those of the universal type such as cranes, trucks, etc., which I have already mentioned.

I stress this point about machinery because when people talk in a vague way about the lack of machinery at British ports it is proper to ask if they have considered the nature of the trade dealt with, and what machinery they specially have in mind.

It is an undoubted fact that a ship itself is a very expensive machine, and it should not therefore be left idle for so long a period as is now the case. It seems absurd for the work of discharging and loading vessels generally to be restricted to certain hours, except at penal rates of pay for labour. Imagine the smaller amount of shipping tonnage that would be sufficient to carry on the maritime trade of this country and the less extensive dock accommodation that would consequently be needed if the discharging and loading of ships were carried on continuously night and day, and the resultant cheapening of costs. No flour miller, to take the case of an industry where machinery looms large in these days, could get the full benefit of his expensive machinery unless he worked it for 24 hours a day. The matter I mention is, however, one for shipowners as a whole to deal with, and it involves a big question of adjustment of labour, but I think that a step in the direction I have indicated would be to the benefit of labour itself.

Subsidised Ports.

The ports of this country, as a general rule, are self-contained and self-supporting; they are dependent upon the revenue derived from the rates charged on the ships and goods using their facilities and from the charges made for the various services rendered. The Trust Ports do not work for profit, and after the fixed interest and other capital charges and the working expenses have been paid, any surplus revenue is used for the benefit of the undertaking. This benefit usually takes the form of reduced charges. At the Continental ports this is not the case. The chief Continental ports are owned by their respective cities, and the line of demarcation between a port and city service or even a State service does not seem to be clearly defined. It is naturally difficult to get definite information on this point, as the finances of the ports are to a great extent merged in the municipal accounts, but one is able to gather that on the Continent:—

(a) Such dredging as is necessary in the channel leading from the sea to the port is usually done at the cost of the national exchequer.

(b) The capital cost of some of the port works is borne nationally.

(c) Some services, such as policing, scavenging and the provision of roads, are regarded as part of the cost of the municipality.

(d) The ports are dealt with leniently in the matter of rates and taxes.

(e) The railway lines adjoining the quays are apparently provided by the railway authority, this in some cases being the State.

All this means that the cost of working and maintaining the ports (i.e., the portion of such actually debited to the ports) which has to be defrayed by charges on the users of the ports, is much lower than it would be if the same system were in force as that which obtains at the self-contained ports in this country where all the costs of works, of maintenance, of dredging, of policing, etc., have to be charged to the users of those ports. The Continental city authorities frankly admit that their ports are regarded as of such value to the community that the community at large submits to taxation in order to assist them.

In this connection it will not be forgotten that some of the Continental ports are centralised or national ports in the sense that they deal with the bulk of the imports and exports of their respective countries, which are large countries with comparatively small seaboards. They also deal with an amount of traffic which is not for their own country's consumption or of their own production, thus deriving a profit from services rendered to other countries. They are therefore, in addition to being national institutions serving national needs, competing with each other as gateways for traffic to and from a vast hinterland containing probably a hundred million people. In this country we have no centralised national port to deal with the whole of our oversea imports and exports, but with our comparatively extensive seaboard we have a decentralised system of ports which is the outcome of our geographical conditions. Whether something in the direction of centralisation, as has been suggested more than once, would be an advantage to the community is a matter for consideration. It is a fact that during the last 100 years there has been a considerable diminution in the number of ports in this country. Our chief ports can no longer be regarded solely as local institutions, but as organisations of national importance. Their working and development should be treated on lines of the requirements of the nation as a whole.

In this country it must be remembered that we have no hinterland belonging to other nations such as that behind the large Continental ports, and thus not so much scope for a large transit trade. We have, of course, in some measure something corresponding to it, inasmuch as goods are brought into some of our ports for transhipment to other countries, while other goods are brought to this country where they are sold for shipment abroad. The extent of this transhipment and entrepôt trade may be gathered from the following figures published by the Board of Trade for the year 1930:—

	£
Transhipment, etc, trade (value) of—	
London	114,664,918
Southampton	42,124,980
Liverpool	35,359,518
Other ports	34.603.098
Total for the United Kingdom	£226,752,514

This is equivalent to one-eighth of the total oversea trade of the country.

Before leaving this aspect of the matter I should make one qualification on the question of State aid, and it is this: that legislation of a few years ago has effected an amount of saving on municipal rates at our ports as "freight transport hereditaments," a term which will be familiar, are now assessed at one-quarter of their normal assessment value. Several ports, in addition, have received from the Government through the Unemployment Grants Committee, "grants in aid" of certain capital expenditure on new works. These, however, are small matters and are nothing to be compared with the extensive financial assistance that is given to some of the Continental ports. I have made a rough calculation that if the Port of London Authority were assisted in the same way it could reduce its dues on shipping by at least 50 per cent. Whether it is right or expedient that the general taxpayer should pay directly a large portion of the cost of the ports of a country may be a matter of argument.

Cost of Labour.

The cost of dock labour is one factor in the problem. An examination of the rates of pay discloses the fact that they are undoubtedly lower at the Continental ports. The piecework system of pay is in vogue at London and some other British ports, but on the Continent it does not appear that much work is done under that system. The mere difference in the daily rate of pay is not the whole problem, the vital point being the resultant actual cost per ton of goods handled combined with dispatch. I found in one typical instance recently that the prime cost of labour for discharging a cargo at London was 2s. 6d. per ton compared with 1s. 11d. per ton for a similar cargo at a Continental port, but in comparing discharging costs regard must be paid to the dispatch obtained in each case.

The Problem of Port Costs—continued

It is impossible within the scope of this address to go into the question of the amount of real wages paid to labour out of the docks and shipping industry. It is a big economic question, but as I have hinted in connection with the working of ships' cargoes, there is room for investigation with the view to the adoption of a better arrangement of working in the interests of both employer and employed.

Miscellaneous Items.

There are other factors affecting the cost of providing port accommodation to which I will refer briefly. One is the availability of cheap land for development. At some places the conditions are that extensive tracts of land are capable of being reclaimed from the waterway for port development purposes at a comparatively low cost. At others this is not so; in London, for example, the cost of purchasing land for dock development is enormously high.

Another factor that has affected the matter of costs, so far as foreign ports are concerned, has been the rate of the monetary exchange. For some years that rate was in favour of the shipowner, but the recent depreciation of the £ has in effect increased the costs at the Continental ports in terms of sterling.

Having examined the chief causes of the variation in port charges, and having noted that it is almost impossible to compare the costs of any one port with another owing to our not being able to compare like with like, I think any brief summary of the matter can only be that costs vary at ports according as to whether or not they possess physical and geographical advantages, as to whether conditions are favourable to development or otherwise, and as to the character and volume of the trade dealt with. Further, it is obvious that any port which is self-supporting cannot possibly provide its facilities at the same cost as in the case of a subsidised port.

General.

In a final word, it may not be out of place for me to allude to what the future may hold out for those of us who are engaged in the important business of transport. Transport is an essential part of civilised life, and the prosperity of a nation is largely dependent upon its transportation facilities. Even if a country were self-contained, efficient transport would still be essential, but in our own country it is apparent that we cannot be self-supporting whatever changes may occur in our fiscal policy. We are dependent on other countries for huge quantities of food and of raw and partly manufactured products, and have thus a vital interest in the transport of our oversea trade.

Our future is inextricably bound up with the economic welfare of our country, and in these dark times of world depression in trade we have a special problem to face. That we shall ultimately solve it I have no doubt. As a nation we have a reputation for muddling through to our goal. Our trouble mostly is that we do not know the end we have in view. If we could see the object of our journey we could press forward with confidence and bring into play those qualities we possess. I believe that there still lurk somewhere in the character of the British people the qualities of courage, energy and enterprise which animated the old Merchant Adventurers when they set out from these shores to discover new lands, with the direct result that a Commonwealth of Nations and a Mercantile Marine were established such as had never been imagined before.

Our problem to-day is largely one of exchange and distribution. The world is yielding her products bountifully, yet there is a large amount of poverty and the whole world is in a state of economic indigestion.

This Institute is concerned not so much with the problem of exchange as with the question of distribution. Transport enters into all our commerce, and the extent and the efficiency with which transportation facilities on land, water and air are conducted are of supreme importance.

One essential point is that we should look at the problem of transport as a whole. The word " co-ordination " is very much overworked nowadays, so I use the term " co-operation." The present is a time when it is more necessary than ever to have the closest measure of co-operation in all public utility services. The day of international co-operation has dawned and the era of unlimited competition within the family circle has nearly gone. There is scope for considerable scientific research as regards co-operation between all branches of transport.

That it falls within the province of this Institute to study this matter I have no doubt. If the Institute is to justify its name it cannot be an Institute of railway transport only; it cannot be an Institute of road transport only, or of aviation, or of canals, or of docks. If it is to justify its ambitions and its comprehensive title of The Institute of Transport, it cannot remain satisfied merely to publish papers on technical points relating to one or other branch of transport, but must grapple somehow with the realm of transport as a unified whole, and so create a proper atmosphere in which to deal in an enlightened manner with the problems which are now looming large on our horizon. The golden age of the railways has gone; but the railways under wise control may still have a useful function to perform—a more limited one than in the past, it is true! The self-propelled road vehicle has a wide but not unlimited scope for useful service to the community. The real service to be rendered by canals has yet to be realised. The possibilities of commercial aviation have yet to be explored. The shipping business of this country is carried on with a high degree of efficiency, but there is surely scope for more transport by ships coastwise. Each of these forms of transport is capable of rendering a definite service to the community and should only be called upon to perform the work it is best fitted for. The tendency with workers in all spheres of activity is to regard their functions as the end and not as the means to some other end; for instance, the railway mind seems to look upon docks as existing for no other purpose but to feed the railways.

I visualise, however, a day not far distant when the legitimate function of each of the various methods of transport will be defined clearly and regulated in the best interests of the national needs and, in the picture that will then be on view, docks and harbours will be seen in their proper perspective acting as efficient links between sea transport on the one side and the various forms of land transport on the other.

The Institute of Transport

The Dock and Harbour Premiums, 1933.

Contributions are invited in competition for the two undermentioned premiums donated by the Dock and Harbour Authorities Association. The premiums take the form of:—

A gold medal for award to the author of the paper on a dock, harbour or conservancy subject, adjudged first in order of merit from those submitted for consideration.

A silver medal for award to the writer of the essay on a dock, harbour or conservancy subject, adjudged first in order of merit from those submitted for consideration.

The right is reserved to withhold the award of either or both medals if none of the contributions submitted attains a sufficient standard of excellence.

The writer of any contribution submitted for the gold medal must be a member of the Institute or a member or principal officer of an Authority affiliated to the Dock and Harbour Authorities Association. The writer of any contribution submitted for the silver medal must be a member of the Institute or of the staff (not being a principal officer) of an Authority affiliated to the Dock and Harbour Authorities Association. Contributions must be typewritten on one side of foolscap paper, must be submitted in triplicate, and must not exceed 10,000 words, exclusive of tables, for the gold medal, and 5,000 words, exclusive of tables, for the silver medal. They must be delivered to the secretary not later than May 31st, 1933, and must bear a suitable title. The author must, on a separate sheet, state his full name and address, designation, the undertaking with which he is engaged, the title of his contribution, and whether it is submitted in competition for the gold or the silver medal. The author's name should not appear on the typescript of his contribution.

Contributions which comply with the conditions and are presented at meetings of the Institute (including meetings of Local Sections and Graduate and Student Societies) will, at the request of the author, be accepted for consideration.

A contribution which is not awarded a medal in any one year may, provided it is of sufficient merit, receive consideration the following year.

All contributions submitted will become the property of the Institute, which reserves the right to publish any of them. An author awarded the gold medal may be required to submit his contribution for discussion at a meeting of the Institute, if not already so submitted.

References to books, pamphlets or articles, etc., must be accompanied by explicit particulars thereof to facilitate ready reference, and any extracts from other works must be shown by quotation marks, and their sources indicated. A bibliography should be appended.

The decision of the Council of the Institute will be final and binding and will be published not later than October 31st, 1933.

Notes from the North

Mersey Tunnel Bill.

Birkenhead and Liverpool members of the Mersey Tunnel Joint Committee have come to an agreement on all the provisions of the new Bill to be promoted in Parliament, the main object of which is to make provision for the excess capital required to complete the scheme. As to the future of the Birkenhead ferries, it was agreed that they shall be taken over by the Tunnel Committee for twenty-one years, as provided by the first Tunnel Act. At the expiration of twenty-one years the Tunnel Committee may continue its authority over the ferries for another period of twenty-one years, with power to alter, vary, or extinguish any or all of the services. In the event, however, of the Birkenhead Corporation being dissatisfied with the proposals of the Tunnel Committee in respect of the second term of twenty-one years, that Corporation shall have power to resume full control of the undertaking. Agreement was also reached as regards the rate of liability of the two towns for tunnel expenditure. The aim will be to prevent the tunnel rate in both towns exceeding 5½d. in the £, but if in any year the prosperity of the tunnel is such as to allow a reduction of the Liverpool rate below that figure, Birkenhead, too, is to have a *pro rata* reduction.

Lower Master Porterage.

Mersey Docks and Harbour Board has adopted revised master porters' rates in respect of tallow, in tierces or casks not exceeding 10 cwts. each, and coffee in barrels, and also in respect of rice, in pockets not exceeding 50 lbs. each, delivered overside. The Board has also adopted the following dock rates and town dues, less 5 per cent., on charcoal briquettes, viz:—Inwards, foreign, 2s. 3d. per ton; outwards, foreign, 1s. per ton; inwards, coastwise, 6d. per ton; outwards, coastwise, 6d. per ton (not at present collected).

Fleetwood Sea Defence Works.

Fleetwood's determined bid to transform the town into a modern resort is perhaps best indicated in the abstract of accounts for the year ending March 31st last, which show a capital expenditure of £66,525. The chief items in this total are £11,542 spent on sea defence work and £16,605 on a new main drainage scheme. Sales of gravel on the foreshore increased a balance of £7,748 to £15,171.

Birkenhead Bridge Works.

The Mersey Docks and Harbour Board have closed the bridge over the Wallasey Dock and East Float Passage, Birkenhead, for a few weeks to permit of the completion of the bascule bridge. Meantime a bridge for pedestrians only is provided, and road traffic to and from the eastward of the East Float can proceed via the east end of the Wallasey Dock and Morpeth Lock, and the Morpeth branch dock bridges, and other traffic over the Duke Street bridge.

Ribble Estuary.

The total area of the Ribble estuary is 58¼ square miles, and of that, 14¼ square miles, or 24½ per cent., has been reclaimed since 1838. Of the 14¼ square miles reclaimed, nine have been enclosed and 5¼ square miles are outmarsh covered at high tides. At present there is in front of Hesketh embankment accreted grassland more than half a mile wide ready for enclosure. But the cost of labour to make an embankment is so great, while the rent obtained from agricultural land is so little, that it is not worth while, even though the land is rich and needs no manure for the first ten years after enclosure.

Obituary.

Mr. James Evans, who was for over fifty years with the Manchester Ship Canal Company, Bridgewater Department, has died at Hunts Cross, Liverpool, in his 78th year. Mr. Evans entered the service of the company in 1873, and was traffic agent, resident agent, and superintendent agent at Warrington, Liverpool, Runcorn, Manchester and Lymm, until his retirement in 1926. Mr. Evans was the traffic superintendent at Manchester from 1912 to 1915.

Drop in Ship Canal Traffic.

There was a big drop in Manchester Ship Canal traffic receipts in the month of October compared with October of last year, the respective figures being £84,438 and £98,408. No doubt the labour dispute in the cotton industry has had an unfortunate effect in causing the slowing down of traffic, coupled, of course, with the general industrial depression. For the first ten months of the current year total traffic receipts were £926,871 as against £959,411 in 1931, representing a total decrease of £32,540.

New Irlam Wharf.

Addressing the November meeting of the Manchester and District Association of the Institution of Civil Engineers, Mr. H. K. Russell gave a description of the new constructional work on the new wharf on the Manchester Ship Canal at Irlam. This wharf is on the north bank of the Canal a short distance downstream from the Irlam railway viaduct, and is intended for the quick and efficient handling of iron ore. Here a bucket grab will unload ore from the ship directly into a weighing hopper, whence it will be discharged into a storage trough formed in the wharf.

Is a Bridge a Highway?

Cross-over traffic between Liverpool on one side of the River Mersey and Birkenhead and Wallasey on the other, must use what is known as the floating bridge—it is supported on pontoons—which connects the Liverpool Pier Head with the landing stage. This bridge is the private property of the Mersey Docks and Harbour Board, which has regulations restricting its use to vehicles which do not exceed a certain maximum tonnage.

Two courts of Liverpool magistrates have, however, come to the conclusion that the floating bridge is a highway, hence the police have powers to intercept what look like overloaded lorries and order drivers to take them on to weighbridges. The most recent prosecution was on November 17th, when a North Wales wagon owner was summoned for refusing to allow a six-wheeled heavy motor vehicle to be weighed. It was stated in court that the Mersey Docks and Harbour Board were fully able to look after their private property, and that the constable was not authorised by any resolution to act on their private property. Mr. Scholefield Allen, who defended, said that although the learned stipendiary had held the floating bridge to be a highway, traders felt this point so strongly that, if necessary, it would be taken to appeal. The bridge, he said, is not a highway under the Road Traffic Act, for the simple reason that if it is, then defendant would be entitled to nineteen tons. If so, no offence has been committed. Mr. Allen added that he was quite certain that the Dock Board would not have the floating bridge a highway at any price, because then their liabilities would become very much higher. Mr. Alun Davies, who prosecuted, submitted that the constable was empowered by regulation to follow a vehicle into a yard or private plot in order to have it weighed. The bench imposed a fine.

Tribute to Ribble Engineer.

Mr. C. le M. Gosselin, the managing director of a leading North of England transport undertaking, speaking at a meeting of the Insurance Institute, declared the Ribble dock as the most courageous trading undertaking in the municipal history of Preston. He praised the indomitable patience, untiring skill and courage of the Ribble Engineer (Mr. J. Barron) in carrying on year after year, plans that he could never see the final completion of. The year before the Corporation took it over, 428 vessels, whose tonnage totalled 28,000, came to Preston. There were now over 1,500 vessels a year, with a tonnage of over 500,000. These figures were some indication of the development of Preston as a port.

Amalgamation of Coaling Services.

From December 1st, the coaling and stevedoring activities of the Pacific Steam Navigation Company at Liverpool docks, will be under the control of the Port of Liverpool Stevedoring Company, with which the dock organisation of the Pacific Line is being amalgamated. The P.S.N.C. hopes to be able to maintain continued employment for most of their present staff, but employees may be required to undertake any other work as required at the customary rate of pay, and to be laid off during any period when employment is unfortunately not available. The Port of Liverpool Stevedoring Company is a subsidiary of Furness Withy Lines, and in addition to continuing the handling of cargoes inward and outward for these steamers, will be responsible also for the coaling of the vessels, hitherto given out to contract. The stevedoring company will bunker the ships of the P.S.N.C. and probably the Royal Mail steamships and all the various other associated lines utilising the port of Liverpool in connection with the South American and Mediterranean services.

New Sand-pump Dredger.

Messrs. Cammell Laird and Co. are shortly to launch a new sand-pump dredger for the Mersey Docks and Harbour Board, the cost of which is £103,000, and a new £40,000 ferry-boat for the Birkenhead Corporation.

Notes from the North—continued

Tunnel Tenders Accepted.

Tenders which have been provisionally accepted by the Mersey Tunnel Joint Committee include the following for the building of three of the ventilating stations, the figures given being inclusive of the cost of the steel work:—New Quay, Liverpool, £26,316, Messrs. Henry Boot and Sons, Ltd., Sheffield; Sidney Street, Birkenhead, £76,928, Messrs. Robert McAlpine and Sons, Ltd.,; and Taylor Street, Birkenhead, £30,396, Messrs. Henry Boot and Sons. The contract for building work on the North John Street ventilating station has been let to a local firm of contractors for just over £100,000. The contract for the Pier Head ventilating station has still to be placed. Meantime, Messrs. Redpath, Brown and Co. (Manchester and elsewhere) have secured the order for the constructional steelwork of the six ventilation buildings, which it is estimated will cost £120,000. Sir Robert McAlpine and Sons have undertaken to build what is called the "traffic plaza" on the Birkenhead side for £26,090. This is the main exit to the tunnel on the Wirral side of the river. The contracts for electrically-driven fans have been placed at about £33,000. There are to be 29 fans in all, 18 for blowing air in and 11 for extracting it. Those which inject the air—though only nine will work at any one time—have an input capacity of 2½ million cubic feet per minute. The Sturtevant Engineering Company, of London, and Messrs. Walker Brothers, of Wigan, have secured the contracts for their supply and erection. Elaborate estimates have been prepared to illustrate what the financial effect will be of ventilating adequately a tunnel constantly charged with carbon monoxide exhaust from thousands of motor vehicles. The total arrived at is about £1,500,000. This brings the entire bill for the tunnel into the region of £7,000,000. But whereas it was estimated in 1925, when the scheme was started, that the charge on Liverpool and Birkenhead rates would be 4d. in the £, it is now calculated that the extra works will only increase that levy to a total of 5½d. or even 5⅓d.

Longer Dock Trains.

Although Mersey Docks and Harbour Board is now operating goods trains of increased length along the line of docks, in conformity with their amended by-laws, no inconvenience appears to have resulted to owners of motor lorries and horse carts entering or leaving the dock estate, despite their earlier apprehensions. It may be remembered that when the Board contemplated amending the by-laws, they communicated their intentions to the Liverpool transport associations, which raised objections mainly because they feared congestion was likely to occur at dock entrances, due to the obstruction caused by the passage of long trains of waggons. The Board is carrying out its undertaking not to allow trains to stand for any length of time in front of open gateways, and when it is necessary for them to stand they will break up trains to enable road traffic to have uninterrupted access to and from the Dock Estate.

Bonded Warehouse for Preston.

Owing to the vast number of the articles on which import duties must be paid, it has become necessary to provide bonded warehouse accommodation at Preston. When the new tariffs were introduced there were no facilities at Preston Docks for bonding goods, such as paper, laths, and other materials, imported from the Continent, upon which duty had to be paid. As delivery could not take place until the duty was paid, merchants had to pay whether they wanted their goods immediately or not. With the provision of the bonded warehouse, the merchant can leave his goods on the dock estate and pay the duty whenever he requires his stock. The cost of transport to bonded warehouses at Manchester or Liverpool is thus saved, and deliveries can be effected direct to railway or road vehicle. "The bond will be a distinct advantage to traders," stated Mr. N. M. Hood, assistant traffic manager at Ribble Docks, "and it will bring Preston into line with many of the large ports. A great deal of time, expense and worry will thus be saved on all sides."

Aden Port Trust.

The following are the returns for the month of September, 1932, of shipping using the port:—

	No.	Tonnage
Merchant Vessels over 200 tons ...	108	459,015
,, ,, under 200 tons ...	6	712
Government Vessels	1	1,446
Dhows	63	1,193
PERIM.		
Merchant Vessels over 200 tons ...	15	39,149

The number of merchant vessels over 200 tons that used the port in September, 1932, was 108, as compared with 121 in the corresponding month last year, and the total tonnage was 459,000 as compared with 464,000.

Excluding coal, salt, fuel oil and military and naval stores and transhipment cargo, the total tonnage of imports in the month was 6,700, and of exports 4,200, as compared with 6,400 and 4,100 respectively for the corresponding month last year.

The total value of imports, excluding Government stores, was Rs.42,06,000/-, as compared with Rs.39,01,000/- for September, 1931, and of exports Rs.27,44,000/-, as compared with Rs.24,73,000/-.

The total value of both imports and exports together was Rs.69,50,000/-, as compared with Rs.63,74,000/-.

Imports during the month were above those for September, 1931, in the case of coffee, grain, pulse and flour, hardware, sugar, grey, white and printed or dyed piece goods, twist and yarn, and manufactured tobacco; and below in the case of gums and resins, raw hides, seeds, raw skins, unmanufactured tobacco, and private treasure.

Exports were above those for September, 1931, in the case of coffee, hardware, raw hides, raw skins, grey, white and printed or dyed piece goods, twist and yarn, unmanufactured and manufactured tobacco; and below in the case of grain, pulse and flour, gums and resins, seeds, sugar, and private treasure.

TRADE OF THE PORT.

Article.	Unit	Imports.		Exports.	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal	Tons	0	0	0	0
Coffee	Cwts.	5,614	1,88,057	9,383	4,38,720
Grain, Pulse and Flour	,,	27,595	1,45,385	14,616	76,612
Gums and Resins	,,	353	7,103	1,554	21,890
Hardware	—	0	23,251	0	16,908
Hides, raw	No.	860	628	6,346	5,290
Oil, Fuel	Tons	49,358	12,33,950	0	0
,, Kerosene	Gls.	95,432	62,303	4,216	2,730
,, Petrol	,,	8,911	10,768	512	641
Salt	Tons	0	0	26,850	3,09,000
Seeds	Cwts.	3,943	36,759	604	6,822
Skins, raw	No.	190,584	72,852	313,274	1,27,162
Sugar	Cwts.	17,735	1,17,524	10,258	67,480
Textiles—					
Piece Goods, Grey	Yds.	5,341,760	7,87,912	3,539,885	5,13,770
,, ,, White	,,	519,841	89,461	209,033	38,551
,, ,, Printed or Dyed ...	,,	1,083,725	2,09,019	1,151,209	2,57,357
Twist and Yarn	Lbs.	239,700	1,17,903	167,042	85,727
Tobacco, Unmanufactured	,,	297,136	54,721	824,348	1,27,100
,, Manufactured	,,	52,108	42,616	47,124	42,818
Other Articles	No. of Pkges.	58,257	8,08,140	18,143	3,31,735
Treasure, Private	—	0	1,97,901	0	2,74,024
Total ...	—	—	42,06,258	—	27,44,337

Chain Cable and Anchor Testing Machine

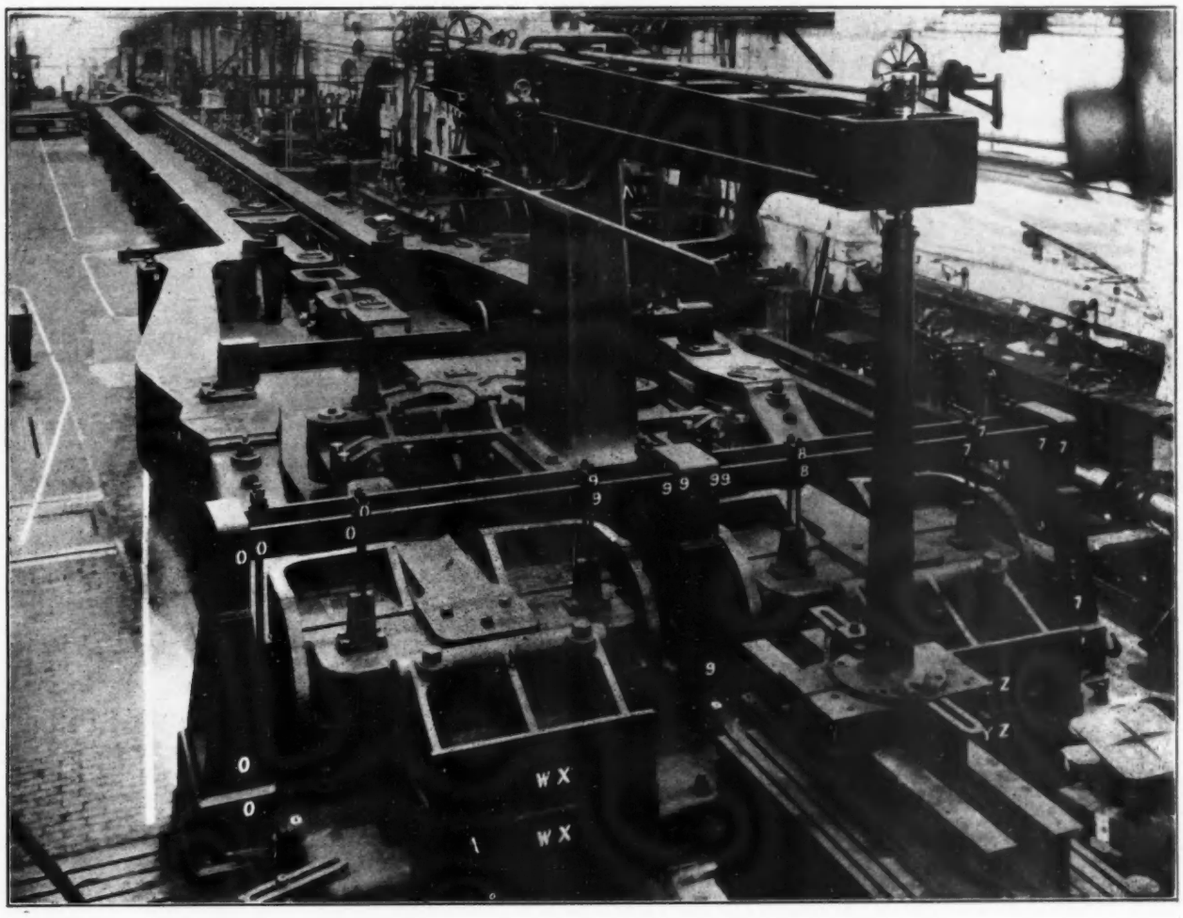


Fig. 1. General View from weighing end.

THE ever-increasing size of passenger and cargo vessels has brought about the installation by Lloyd's British Testing Co., Ltd., Netherton, Dudley, of a testing machine of larger capacity constructed to the Testing Company's specification and the Board of Trade, capable of testing not only the chain cable and anchors necessary for the largest vessels yet contemplated, but also all sizes of steel wire ropes, wire rope pulley blocks, and other miscellaneous specimens.

This machine is the largest lever type chain cable and anchor testing machine yet constructed, having a capacity of 750 tons, and has been made by W. and T. Avery, Ltd., at their famous Soho Foundry, Birmingham. Fig. 1 gives an indication of its massive proportions. The overall length is 178-ft. 6-in., the overall width 21-ft., and the overall height 17-ft. Part of the machine is sunk below the floor of the test house, so that the overall height above the floor level is 10-ft.

The sinking of the machine in the floor is necessary to facilitate the handling of heavy specimens. It also permits perfect freedom for the operator around the steelyard, provision having been made to carry floor plates from the standard and upon ledges cast on the several suspension gear brackets.

The total weight of the testing machine is about 250 tons. A number of the components each weigh over 10 tons, the heaviest being the main base plate, which is in two parts, the complete casting weighing 36 tons. The machine is of the fixed frame type. That is, the weighing portion is arranged at one end and the straining portion at the other end of a frame or bed rigidly secured to the foundations. Suitable gripping attachments hold the specimen to be tested between the weighing and the straining portions of the machine.

The straining portion comprises a large cylinder and ram (of the single acting type) for applying the strain, and a smaller cylinder and ram (also of the single acting type) for returning the main ram and attachments to position after a test. Both cylinders are steel castings and are provided with the usual hydraulic packing. The main cylinder is designed for an accumulator pressure supply of 2 tons per sq. in., and the return cylinder is suitable for a pressure of $\frac{1}{2}$ ton per sq. in.

As it is not anticipated that the machine will regularly be required for testing to loads near its full capacity, and to permit of an economy of pressure water, an inner ram has been provided at the suggestion of Mr. Henry Green, M.I.M.E., Superintendent of the Proof House, Netherton, to operate inside the main ram, which then functions as a cylinder. When the machine is used at the lowest capacity the main ram is locked in its innermost position in the main straining cylinder by means of shear pins in the upper and lower tie bars secured to the straining and return cylinders. The locking and unlocking of the main ram to these two tie bars is carried out simultaneously by the operation of a single hand-wheel.

The main straining ram is 24-in. diameter and the inner straining ram is 12-in. diameter. The stroke of either the main or the inner ram is 9-ft. The ram of the return cylinder is 12-in. diameter, but the length of the return cylinder is rather longer than that necessary for a ram of 9-ft. stroke. This permits of a water cushion at the back of the ram of the return cylinder to absorb any excessive recoil which may occur if a specimen breaks when the main ram is near the end of its stroke. Another safety device to nullify recoil effects at the straining end of the machine is a large spring loaded valve directly at the end of the return cylinder. This can be set to relieve at the pressure desired, and is open to atmosphere; any effusion from this source falls into a pit immediately below the valve.

To prevent corrosion and facilitate smooth action, and to permit pressure maintenance, when required for a period, the main and inner straining rams have been surfaced by the Fescol Process with electrically deposited nickel. This was suggested by Mr. George Hatton, C.E., the Chairman of Lloyd's British Testing Co., Ltd.

The pressure supply to the main and return cylinders is governed by a special four-spindle valve of the interlocked type. This is located adjacent to the steelyard to permit centralisation of the machine control.

The main straining cylinder is fitted in the bore of a large steel anchor casting, to which it is secured by adequate steel studs.

An iron base casting projects from the main cylinder anchor casting towards the return cylinder to serve as a guide for the crosshead, which is secured to the straining ram. It is through the medium of this crosshead that the strain is applied to the

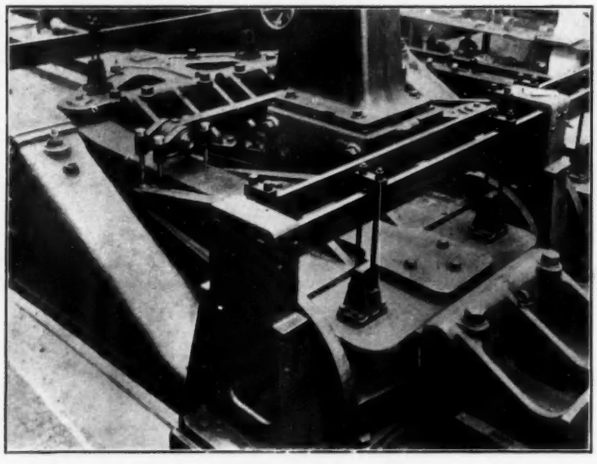
Chain Cable and Anchor Testing Machine—continued

specimen. Long tension bars are secured to the crosshead and extend into a trough between the straining and weighing portions to within approximately 30-ft. of the main base casting at the weighing end of the machine. The tension bars are bored at intervals of 3-ft. (except at the joints where the pitch is 4-ft.) to allow specimens of various lengths from 3-ft. up to maximum to be tested. Chain cables 100-ft. in length may be secured to and tested in the standard jaw and pin shackles embodied in the machine, but special holders have also been provided for testing samples of chain cable made from material $4\frac{3}{8}$-in. diameter. With these holders in use the machine will still accommodate the standard proof specimen of 15 fathom length.

One of the holders is in connection with the weighing portion of the machine (described later) and the other—the straining holder—is made suitable for ready attachment at any of the bored holes in the tension bars. This holder is secured by means of two shear pins, one on either side, which are simultaneously operated through gearing by a hand-wheel to engage in the tension bars.

The trough is built up of iron castings in six sections. It is 4-ft. 6-in. wide and provided with rollers to facilitate the free movement of the tension bars. It also has a machined track, along which the straining holders is moved on rollers when an adjustment in its position is required.

The two tension bars are built up of sections of steel very accurately machined and dovetailed together.



Main levers, links, suspension gear and recoil gear, etc.

A bay is provided for the testing of anchors, wire rope pulley blocks and other specimens of greater depth than the depth of the testing trough. The bay is made by two robust struts secured at one end to the main base casting, and at the other end to a steel bridge casting which terminates the trough.

The width of the anchor bay at this end is 9-ft., opening out to 13-ft. at the main base casting. The length of the bay is 20-ft. from the centre of the eye of the shackle, making it possible to test anchors 12-ft. over the palms. The weigh of such an anchor is about 20 tons, and to accommodate anchors of this size a pit 4-ft. 6-in. deep is provided in the foundations. In order that the anchor bay may be clear for testing anchors, the tension racks are not allowed to protrude into the anchor bay, and master bars are provided to enable the holders to be brought together to permit the testing of short specimens down to 3-ft. in length. When testing cables, the pit below the anchor bay is covered with heavy steel plates designed for ready handling and supported upon ledges provided on the inside of the strut castings. The cover plates have machined tracks which continue on from those in the trough castings, and to ensure that the tracks are in line the sections are spigotted together. Thus the straining holder may be moved from one end of the machine to the other.

To facilitate easy handling of cable specimens, large vertical rollers are provided adjoining the anchor bay and supported upon the steel bridge casting at the end of the trough. They are provided with ball bearings and are therefore quite free to revolve. These rollers are utilised when specimens are drawn along the trough of the machine, for which purpose an electrically driven winch, located at the straining end of the machine, is used.

The specimen holder at the weighing end of the machine is in connection with two bell crank levers which transmit the strain on the specimen to the steelyard, where it is balanced off by a poise weight. The bell crank levers, which are steel castings, are arranged one on either side of the standard supporting the steelyard. The final connection between these main levers and the weighing holder is made by means of a large triangular steel casting, at the near end of which the two main connecting links are secured by means of shear pins. Each link is built up of steel casting sides and a heavy steel backing to receive the main bearing which engages the load knife-edge of the main lever. The leverage ratio of these levers is $7\frac{1}{2}$ to 1, and each is fitted with a load and fulcrum knife-edge 77-in. long. This length is in accordance with the Board of Trade regulation that the loading of knife-edges in a testing machine must not exceed 5 tons per lineal inch. The knife-edges are produced from special steel, and are hardened and ground accurately to gauge. Two heavy steel castings rigidly bolted to the main base, one on either side of the standard for the steelyard, provide the fulcra for the main levers, and each fulcrum bracket is fitted with a special hardened steel bearing 77-in. in length.

Both the main levers and links, and the triangular-shaped link connecting to the weighing holder, are supported upon knife-edges to ensure perfect weighing freedom.

To permit of the transmission of the load from the main levers to the steelyard, a wide steel yoke casting is utilised, having slung along at its ends two connecting shackles, each provided with a hardened steel bearing to engage the transmission knife-edge of main lever. The upper end of the yoke-casting is linked up with the load knife-edge of the steelyard by means of another link fitted with a hardened steel bearing. The complete connection between the main levers and the steelyard permits the action of a full universal joint to ensure alignment. The necessary bearing for the fulcrum knife-edge of the steelyard is fitted at the top of the standard erected upon the main base casting for this purpose.

A complete set of gauges has been provided for periodically checking over the levers of the machine.

The steelyard is built up of steel plates suitably crossbraced. It is traversed by a poise which runs on rollers provided with ball bearings. This poise, the travel of which is 200-in., is made in two portions, the combined weight being 2 tons. As the machine has been specifically designed to avoid the use of proportional weights suspended from the end of the steelyard, it will readily be appreciated that the total leverage of the machine is 375 to 1. A vernier is fitted to the minor portion of the poise, and this indicates the test load upon a scale plate secured by brackets to the steelyard. The same vernier is utilised when the combined poises are used.

The scale plate carries two sets of graduations, the major set, used with the full poise weight, is up to 750 tons by 10-cwt. divisions, but by means of the vernier fitted to the poise, load readings to 1 cwt. are obtained. The minor set of markings used with the minor poise range up to 150 tons by 2 cwt. divisions, the vernier further sub-dividing to 28 lbs.

When the minor poise is used the major portion is locked in position at the back end of the steelyard. The minor portion is detached by the simple operation of two hand-wheels at the end of the small poise.

A propelling nut of the split variety secured in the minor portion of the poise is provided so that any adjustment necessary on account of wear may readily be made.

The actual propulsion of the poise is carried out by means of the hand-wheel at the side of the standard supporting the steelyard. It operates a horizontal shaft which, through bevel gears at the back of the standard, transmits the drive, *via* layshafts and spur gearing to the poise-propelling screw carried on ball bearings in the centre of the steelyard and extending from one end to the other. This arrangement of poise drive permits an uninterrupted view of the steelyard scale plate throughout the test.

A flotation pointer, arranged immediately above the hand-wheel for propelling the poise, readily indicates to the operator the balance of the steelyard.

To absorb shock to the steelyard when a specimen breaks, buffer springs are provided on a carrier column at the long end of the steelyard. It is at the main levers and links, however, where the main recoil shock occurs, and special provision has been made to receive this by a heavy casting directly opposite each main lever and its link. This casting is provided with special hard wooden blocks so adjusted that immediately a break occurs the recoil is taken up and dissipated.

As the machine with its standard shackles is capable of testing specimens of any length from 3-ft. to 100-ft., leaving available the stroke of the ram, it will be readily understood that the machine can be used for both proving and breaking samples of chain cable, in addition to testing anchors; whilst by the use of suitable holders samples of wire ropes and a variety of specimens can be tested. The machine, although of such a high capacity, is capable of recording loads by increments of 28 lbs. It is thus a very useful addition to the testing equipment of the country, and the co-operation of Mr. George Hatton, C.E., and of Mr. Henry Green, M.I.M.E., has helped to ensure that the machine is particularly suitable for the special purpose for which it is required.

Scottish Harbour Notes

Clyde Navigation Trust

General Terminus Quay.

THE Clyde Trustees have decided not to proceed with the erection of the proposed goods shed at the General Terminus Quay, the cost of which was estimated at over £14,000. This shed was part of a scheme of reconstruction and widening of the General Terminus, which was approved for grant from Exchequer Funds as an Unemployment Relief scheme. There has been a considerable change in circumstances since the provision of additional shed accommodation at this part of the harbour was first contemplated. In coming to their decision the Clyde Trustees have been influenced by the fact that the state of trade at the port does not at the present moment admit of any increased shed facilities, and also that the construction of a shed at this side would interfere with the scheme of a temporary ferry at Finnieston; whilst it is also suggested that it would not be convenient for railway working.

Appointment of Chairman and Deputy-Chairman.

Mr. W. F. Robertson and Mr. William Cuthbert have been re-elected Chairman and Deputy-Chairman of the Clyde Trust for a further year.

Speaking on his re-election, Mr. Robertson referred to the heavy item of interest charges, in respect of which he stated there was the prospect of a substantial reduction from now onwards, and that whilst revenue was still down, there were indications that the downward trend was being arrested and the downward curve flattening out appreciably.

Mr. George W. Service was reappointed as the West of Scotland representative on the Dock and Harbour Authorities Association.

Australian Trade with Scotland.

A marked progress in the development of trade between Australia and the Clyde is evidenced by the news to hand that arrangements have been completed on behalf of the Clyde Navigation Trust, through their commercial manager, with Messrs. Alfred Holt and Co., the shipping firm owning the well-known Blue Funnel Line, whereby Messrs. Holt and Co. are putting on an itinerary of eleven refrigerated vessels in the first six months of next year to accommodate the increasing trade between Glasgow and Australia. These vessels will bring to the Clyde, Australian apples, pears, butter, cheese and meat, in addition to general cargoes of canned fruits, dried fruits, wines, grain, flour, wool, timber, metals, etc.

Up to within the last year or two the refrigerated trade from Australia has previously been concentrated on London, and to some extent Liverpool. It is only four years ago that the Clyde Trust decided to take some action to endeavour to build up for Glasgow and Scotland some of the trade with Australia and New Zealand which was concentrated in the South.

Mr. Harold M. Ford, who was then Secretary of the Trust, made an extensive tour of the two Dominions, and the wheels were set in motion for the development of this trade. On his return the Clyde Trust established a Commercial Department and appointed Mr. Ford commercial manager with the duty of developing overseas trade with Glasgow, with special reference to that of the Dominions.

As was disclosed at the last two annual meetings of the Trust, the trade upon which Glasgow had hitherto depended largely for its prosperity had fallen tremendously, namely, that of coal, and iron and steel products, due largely to the general depression from which the country has suffered during the last few years. Consequently it has become more and more a necessity to attract an increasing miscellaneous trade to the city, and it is with the object of developing trade in miscellaneous products that this step was taken.

The necessity for the increased shipping services directly arises from the steps which have been taken by the Trust's Commercial Department in opening up new avenues of trade between the markets of Glasgow and the producing interests in Australia. In four years shipping and trade with New Zealand has been almost doubled, and that with Australia has shown the phenomenal increase of nearly 300 per cent.

The above-mentioned programme is for six months only, and represents from one shipping company alone more than the equivalent of the total refrigerated tonnage which came to the Clyde in a whole year only three or four years ago.

In addition, it is hoped that further services will be arranged as the result of negotiations between the Clyde Trust's commercial manager and various other shipping lines.

In a recent interview Mr. H. M. Ford, commercial manager of the Trust, stated that " the co-operation extended by Messrs. A. Holt and Co. in placing additional shipping facilities at the disposal of the Australian trade will undoubtedly be welcomed both by Scottish traders and the producing and exporting interests of Australia. It is with an eye to Empire trade development that our efforts are being concentrated on opening up direct contact between producers abroad and the marketing interests at home. The results of the Ottawa Conference undoubtedly open up possibilities for trade—which for a long time had been foreseen by some people—which should allow of Scottish traders taking their rightful share in the marketing of Empire products, but unless those engaged in the respective trades on the big Northern markets of Glasgow, Manchester and Liverpool are to be permitted to enjoy direct trading facilities, such as are provided by foreign interests, much of the advantage of the tariff agreements recently entered into will be lost."

We understand that attention is also being concentrated upon trade with South Africa, particularly in regard to the rapidly expanding fruit industry, so far as Glasgow and West Coast markets are concerned, with a view to Glasgow and other West Coast ports and markets being utilised for the development of South African trade.

Revival of Finnieston Bridge Project.

The project of constructing a high level fixed bridge over the Clyde at Finnieston, estimated to cost from one to one-and-a-quarter million pounds, has again been revived by the Corporation of Glasgow, and the Corporation Committee on Cross-River Communication has decided that the question should be reopened. This decision has been taken in view of a report by the Corporation Master of Works as to the cost which would be involved to the Corporation if the Clyde Trustees called upon them to remove the present Finnieston Ferry and provide for temporary accommodation for this elsewhere. In this connection the Committee had before them a report from the City Chamberlain as to the total expenditure incurred to date in the acquisition of the Harbour Tunnel and various properties required for the construction of the new bridge. This expenditure, it was stated, amounted to no less than £450,000. The Committee have recommended in their minute that the Corporation should approach the Clyde Trustees with a view to their agreeing to a less clearance under the bridge than 76-ft., and that the Master of Works should report as to the reducing costs of the bridge by lessening the width from 70-ft. to 64-ft., and that the Master of Works should report as to the expediency and practicability of utilising the Harbour Tunnel for quay to quay traffic, and as to the improvements necessary to be made on the tunnel for that purpose.

Last July the Corporation decided to postpone consideration of the whole matter *sine die*.

It would appear that this question, which has given rise to so much controversy among various authorities in Glasgow, is again to be revived.

Leith Dock Commission Meeting.

At a recent meeting of the Leith Dock Commission it was stated that arrangements had been made by the railway companies so that in the future the hauling of the traffic within the Leith Docks will be carried out by engines of one company—the London and North-Eastern Railway Company. Previously the dock railway traffic was operated by the L.M.A. and L.N.E.R. companies, but by this arrangement the railways will effect an economy. At the same meeting information was forthcoming with regard to the new grain elevator warehouse at the Imperial Dock, and it was reported that the foundation work had cost £27,892, as against an estimated cost of £29,900. This intimation was received with much satisfaction by the Commissioners.

Increase in Revenue at Wick Harbour.

It has been reported to Wick Harbour Trustees that the revenue for the past year was £13,645, as against £10,261 the previous year, and much satisfaction was expressed at this favourable comparison at a recently held meeting when the annual financial statement was submitted. It was pointed out, however, that last year's revenue had been down by almost six thousand pounds, so that the income was still far from normal, and it was also noted that the Trustees were finding difficulty in meeting the loan charges. In the circumstances it was suggested that the Government authorities be approached with a view to having the harbour debts reconsidered and, on this being unanimously agreed to, it was decided to solicit an interview with the Secretary of State for Scotland on the subject.

Greenock Harbour Trust's Satisfactory Year.

It is recorded that the annual statement of Greenock Harbour Trust for the past year shows a balance of £11,095 on the nett revenue account, and satisfaction was expressed at the recently held annual meeting of the Trustees that in a period of such depression in the industrial world—particularly in the West of

Scottish Harbour Notes—continued

Scotland—the results for the year had been so comparatively favourable. Several members of the Trust took the opportunity of voicing their satisfaction with such favourable returns under present-day conditions, and complimentary reference was also made to the economical manner in which the affairs of the Trust were managed by the officials.

Extension Scheme at Anstruther Nearing Completion.

Shortly there will be completed the important extension scheme at Anstruther Harbour which, it is estimated, will cost £20,000. The opening ceremony early in December will be the signal for a new era in the East Fife herring industry, as the harbour will now accommodate twice as many boats as formerly. So far as discharging and general harbour work is concerned, fishermen will now find everything to their satisfaction, and the effect of the increased traffic at the harbour during the winter herring fishing is being eagerly anticipated by haulage contractors and others. Anstruther may, indeed, become the centre of herring fishing on this coast, as the new and wider channel which has been made at the east pier will enable large steel drifters to be berthed at any period from half to full tide. The improvement work has been financed by £5,500 from the Black bequest, £10,500 from the Government, and £4,000 from the Fishery Board. The contractor (R. Terras, junior, East Wemyss) is to be complimented on the admirable way he has effected the alterations.

Rothesay Harbour Trust.

It was intimated at the annual meeting of the Rothesay Harbour Trust that the income for the past year amounted to £7,120, as compared with £7,063 the previous year, and that the expenditure amounted to £6,725, as compared with £6,621 the previous year. Repair costs during the year represented a fairly heavy item (£2,333), but it was explained that much more work had been done than for a number of years past. This included the redecking of much of the local pier, and also relaying a good area with midget setts; while the Trust now aimed at remodelling the surface of the quay and taking away the gutter close to the wood decking in order to make the whole surface a uniform camber from side to side. When this work was completed the whole surface of the pier would be renewed, and thereafter (it was felt) would cost very little in the way of expenditure for the succeeding twenty years. It was generally agreed by the Trustees that as a result of recent renovation work the pier was now in better condition than it had been for a considerable time.

Mersey Docks and Harbour Board

Annual Report for the Year ended 1st July, 1932

At a meeting of the Mersey Docks and Harbour Board, held on November 17th, 1932, the annual report was presented by Richard D. Holt, Esq., Chairman. The report was as follows:

"Gentlemen,—We have before us the accounts for the year ended July 1st, 1932, together with the Engineer's report on our Works during that period.

"The year in question has been exceptionally difficult for everybody—it comprises the financial crisis of August and September, 1931, and the consequent collapse of the Government—the constitution of a new Government and the enforcement of drastic measures—partly of economy but even more of taxation in order to balance the National Budget.

"Under such circumstances no one could expect a year of prosperous trade, but I am glad to be able to say that on the whole we have done better in the year under review than during its predecessor.

"Our revenue has fallen off by £69,097—the decreases being:

	£
Rates and Dues	16,054
Rents of Property	17,997
Dock Traffic, &c., Group	15,780
Warehouses—Surplus	19,266

But when we analyse the decrease in rates and dues we find that there was an increase of £28,264 in the dues on goods and a decrease of £44,318 in the dues on shipping. More traffic was handled at the docks, but by fewer ships, which is explained by the fact that shipowners have been forced to economize and are taking steps to load their ships more fully. This desire for economy on the part of shipowners is the principal cause of the reduction in rents, as many appropriated berths have been given up which were a convenience but not a necessity.

"Against the falling off in receipts there has been a greater reduction in expenditure amounting to £146,537, and our thanks are due to the Special Committee which investigated this subject during the autumn of last year. The full results of their efforts have not yet been obtained, as only rather more than half the year's working was affected by their inquiry. While it is impossible to effect any sensational reduction in the Board's expenditure, I am satisfied that further economies can be made and are being made as the result of a strict scrutiny of all expenditure by the various committees and their officials. I feel sure that all the members of the Board and all our principal officials realise that strict economy in administration is an essential condition for the success of the trade of the Port.

"Rates of interest during the year were high—the Bank Rate at one time rising to 6 per cent. The high Bank Rate necessitated our paying higher rates for our borrowings, but now money rates are very much cheaper. Bonds were issued at rates varying from 5¼ to 4¼ per cent., and our Promissory Notes from 5$\frac{13}{16}$ to 1½ per cent. The higher rate was paid for only one short loan and the latter rate of 1½ per cent. is the cheapest at which the Board has been able to borrow in its history. Bonds amounting to £2,062,713 at £5 5s. 11½d. per cent. were renewed at an average rate of £4 17s. 3¼d. per cent. and new Bonds amounting to £2,028,446 were issued at an average rate of £4 17s. 4¼d. per cent.

"The average rate on the Board's Debt (Promissory Notes excluded) at 1st July, 1932, was £4 9s. 8¾d. per cent., as compared with £4 10s. 4¾d. per cent. at 1st July, 1931.

"It is gratifying to be able to record that since the end of the Board's financial year the rate of interest has fallen and that the Bonds which are now falling due can be renewed at a saving of fully 1 per cent. in the rate of interest.

"It must be remembered that a very large proportion of the expenditure of the Board does not fluctuate with the volume of trade passing through the docks. More than one-half of the total expenditure is interest on the moneys borrowed to construct the docks, and though part of the expenses of maintenance may be postponed during a period of bad trade, very little of these expenses can be avoided permanently except by allowing some sections of the docks to become derelict.

"The reconstruction of the Clarence and Trafalgar Docks is now practically complete and the new work is most satisfactory and should prove a real help to the Coasting Trade, who thereby get better access to the deep water entrances further north. It is unfortunate that the tariff war with the Irish Free State is preventing the development of our Cross-Channel trade. The loss of the importation of livestock and of the export of coal is a serious injury to the Port and in particular to our Estate at Birkenhead. The fact that this Port is a loser by the actions taken by our Government in connection with the dispute with the Irish Free State does not prove that the actions of our Government are not right and proper, but it does suggest that when duties are imposed for the purpose of keeping traffic out of the country some portion of the revenue collected should be handed over to the harbour authorities and others who lose revenue by the exclusion of th traffic for the accommodation of which they have spent large sums of money.

"The work at the Bidston Dock has been progressing satisfactorily. As a measure of economy it was decided to reduce the length of the dock from 1,500-ft. to 1,000-ft. and the expenditure from £913,000 to £708,000. It is hoped that the dock may be opened sometime in March next, and it will provide a most admirable site for any persons requiring to establish works to which immediate access by large ocean-going vessels is desirable. Splendid sites will be available for those desiring to import raw materials for manufacture.

"Work on the Conservancy of the river is going on steadily but there is little change in the channels at present, and of course an improvement in one section does not counterbalance deterioration in another. The consent of the necessary authorities to the extension northward of the training bank on the west side of the Crosby Channel has been given and this work is being pushed on rapidly with every expectation that the channel from the Crosby Ship to the Bar will be straightened and deepened.

"Again I have to thank all our officials for the most loyal and assiduous co-operation during what has been a most difficult year for everybody. We are not through our difficulties yet, but I feel sure that they can be surmounted by hard work and good courage."

Notes of the Month.

Bremen's Seagoing Shipping Traffic during September.

There was a slight decrease in sea-going shipping for Bremen account in the month of September compared with the previous month, both in the number of vessels and in the tonnage; 691 vessels arrived with 662,967 net registered tons—that is, 47 vessels and 13,066 net registered tons (2 per cent.) less. Compared with September, 1931, the number of vessels was 46 larger; tonnage, on the other hand, 57,664 net registered tons (8 per cent.) less.

In the months January-September, 1932, altogether 5,834,697 net registered tons arrived, 661,085 net registered tons (or 10 per cent.) less than in 1931.

Sea-borne goods traffic of the five most important Weser ports amounted to 438,100 tons in September. It thus increased compared with the previous month by 45,200 tons, or 12 per cent., but was 11,600 tons, or 3 per cent., less than September, 1931. Imports during the month under report amounted to 231,800 tons. That is 15,400 tons, or 7 per cent., more than in the previous month. This increase was caused in the first place by considerable arrivals of cotton, which, during this season (from August 1st, 1932) were almost 2½ times as large as during the same period in 1931. In spite of this, there is altogether a decrease in imports of 18,200 tons, or 7 per cent., compared with September of the previous year; this is greatly due to the restriction of grain importation to less than half the normal and of English coal importation to not even one-third of the quantity imported during the same month in 1931.

Exports amounted to 206,300 tons, and thus exceeded the months for comparison by 29,800 tons, or 17 per cent., and 6,600 tons, or 3 per cent., respectively. Compared with August potash transport was much more considerable, but was only just on a level with that of September, 1931.

During the period January-September, 1932, altogether 3,445,500 tons were imported and exported, against 3,793,200 tons in the same period 1931. This is a decrease in traffic of 347,700 tons, or 9 per cent. (in the first half-year 10 per cent.). Imports at 2,137,900 tons showed a decrease of 144,800 tons, or 6 per cent. Piece goods and ore showed particularly large decreases, due to the closing down of the Norddeutsche Hutte. On the other hand, cotton showed very much higher figures. Exports, with 1,307,600 tons, lost 202,900 tons, or 13 per cent. In addition to potash and iron, piece goods were chiefly affected.

This decrease was suffered solely by the Bremen ports. The Oldenburg ports on the Weser showed a considerable increase, particularly through coal.

London's Shipping.

During the week ended October 28th, 874 vessels, representing 921,413 net register tons, used the Port of London; 451 vessels (743,843 net registered tons) were to and from Colonial and foreign ports and 423 vessels (177,570 net registered tons) were engaged in coastwise traffic.

* * * *

During the week ended November 4th, 1,200 vessels, representing 905,017 net registered tons, used the Port of London; 410 vessels (683,959 net registered tons) were to and from Colonial and foreign ports and 790 vessels (221,058 net registered tons) were engaged in coastwise traffic.

* * * *

During the week ended November 11th, 884 vessels, representing 869,195 net registered tons, used the Port of London; 447 vessels (662,145 net registered tons) were to and from Colonial and foreign ports and 437 vessels (207,050 net registered tons) were engaged in coastwise traffic.

* * * *

During the week ended November 18th, 843 vessels, representing 879,346 net registered tons, used the Port of London; 421 vessels (682,408 net registered tons) were to and from Colonial and foreign ports and 422 vessels (196,938 net registered tons) were engaged in coastwise traffic.

Tilbury Passenger Landing Stage.

Thirty-one vessels totalling 306,074 gross registered tons used the Tilbury passenger landing stage during the month of October. Altogether 3,612 passengers were embarked or disembarked at the stage, in addition to baggage and mails.

London's New Flour Mills.

The Port of London Authority have commenced the construction of a new quay at the Royal Victoria Dock, where vessels will discharge cargoes of grain for the new large flour mill being erected by the Associated London Flour Millers, Ltd. The site has been described as " the centre of the centre of the centre of the world," because it is in the centre of London's largest dock system, which makes London the centre of the world's shipping.

Coastwise Vessels: Increased Traffic.

During the first ten months of this year the tonnage of coastwise vessels which used the Port of London was 12,336,982 net registered tons—an increase of 5 per cent. over the corresponding period of 1931.

A New Catalogue.

Sir William Arrol and Co., Ltd., have recently issued an illustrated catalogue on the various types of cranes which they have manufactured at different times.

The catalogue is very well produced and contains 75 pages of very interesting material.

Decrease in Southampton Dock Statistics for October.

Southampton Docks statistics for October contain a preponderance of decreases when compared with the figures for the corresponding period of 1931. There are, in fact, only three increases under the twelve headings under which the statistics are published.

The number of vessels inward declined by 27, from 270 to 243, and outward there was a decrease of 31 ships, 241 as against 272. Gross tonnage inward slumped from 1,418,258 tons to 1,240,496 tons, and outward from 1,364,563 tons to 1,074,200 tons, giving decreases of 177,762 tons and 290,363 tons respectively. Net tonnage inward dropped by 97,013 tons, from 754,731 tons to 657,718 tons, and outward there was a decrease of 158,675 tons, the figures for October this year and October, 1931, being 578,565 tons and 737,240 tons respectively.

The cargo figures afford a striking contrast, for while there was a good increase in imports there was a much bigger decline in exports. Inward cargo amounted to 51,920 tons, which was 2,976 tons in excess of the total handled in the same month last year, but outward there was a drop of 8,632 tons, the total reaching only 27,248 tons as compared with 35,880 tons.

The volume of passenger traffic handled was practically the same as in October, 1931, but the margin that there was was on the wrong side. There was an increase of 1,640 passengers inward, 13,243 as against 11,603; but outward there was a drop of 1,970, 15,533 embarking in October, 1931, as compared with 13,563 during the month under review.

The trooping movements in an outward direction were heavy, 5,002 leaving for overseas as against 3,826, an increase of 1,176. No troops arrived as compared with 364 in October, 1931.

Shipping at Jugoslavian Ports in 1931.

Information is now available about the situation of shipping at Jugoslav ports during 1931. According to these statistics during 1931, 101,135 vessels representing 16,678,431 n.r.t. called at Jugoslav ports, against 96,474 vessels and 14,976,525 n.r.t. in 1930; 91,913 vessels and 14,937,288 n.r.t. in 1929; 84,980 vessels and 14,397,683 n.r.t. in 1928; 70,984 vessels and 11,821,486 n.r.t. in 1927; 69,772 vessels and 10,219,727 n.r.t. in 1926; 62,461 vessels and 9,467,819 n.r.t. in 1925; 55,015 vessels and 7,506,214 n.r.t. in 1924; and 43,231 vessels and 5,701,390 n.r.t. in 1923. Furthermore, figures regarding the goods traffic through Jugoslav ports include 19,730,488 centals imported and exported from and to foreign countries in 1931, against 23,140,567 centals in 1930 and 24,467,392 centals in 1929; and 5,277,137 centals, representing the volume of interior maritime trade in 1931, against 5,039,251 in 1930 and 5,437,263 in 1929. Over 50 per cent. of the foreign maritime trade of Jugoslavia has been concentrated in Split and Sussak. In Split imports and exports from foreign countries included during 1931, 8,735,014 centals, against 9,542,289 centals in 1930, 10,210,005 centals in 1929, and 3,170,718 centals in 1913, while at Sussak maritime trade included 4,812,986 centals in 1931, 6,177,963 centals in 1930, and 5,487,270 centals in 1929. The importance of Split has greatly increased since the war, but it does not appear that facilities there have improved to a corresponding extent. Dubrovnik, which is the terminal station of the Bosniac railway, follows Sussak, in order of importance in connection with the goods traffic trade, particularly as far as the exports of lumber and other agricultural products are concerned. Yet the situation of Dubrovnik has become worse from year to year, as it noticed by the fact that foreign maritime trade has dropped from 3,381,377 centals in 1929 to 2,714,649 centals in 1931. As a matter of fact, this decline is due to the depression in maritime exports, which decreased from 2,345,610 centals in 1929 to 1,317,115 centals in 1931, while imports have shown an increase from 1,036,267 centals in 1929 to 1,397,534 centals in 1931.

The Port of Hamburg *(concluded from page 27)*

THE further development of the harbour railroad stations and other railroad facilities kept pace with that of the basins and quays, but this is not the place to describe it in detail.

The main object of anxiety to Hamburg during the years of unparalleled progress immediately before the war was the problem of the future development of her port. The experience of the preceding forty years, during which the harbour area had increased in size several times over, furnished a certain clue to the development that might be looked forward to, and the demands of trade, shipping, and industry for additional harbour space still went on increasing. Above all it was imperative to provide basins of greater depth, because without them the great improvement made in deepening the channel of the Lower Elbe necessitated by the increased draught of the giant liners would have been of slight practical avail.

It was felt that the territory acquired by the city-state in 1768 was insufficient to meet all the needs of the future. For some time, however, efforts had to be concentrated on the utilisation of the territory still available. The Köhlbrand agreement of 1908, by which some small areas were exchanged between Hamburg and Prussia, and by which the interstate boundary, especially in the neighbourhood of Ross and Neuhof, was slightly altered, provided a basis for further harbour projects affecting this district, the last part still available east of the Köhlbrand. Development, however, could not stop short there. The alteration of the Köhlbrand entrance that had been agreed upon between Hamburg and Prussia, together with the damming-up of Köhlfleth, Mühlenfleth and Maakenfleth, provided an opportunity for converting the small archipelago between the Elbe, Köhlbrand and Köhlfleth into a single district capable of being utilised for harbour improvement schemes. The island thus formed was called Waltershof, after the name of the largest of the farms formerly existing there.

The great harbour improvement scheme dealing with these two areas was approved of in 1909, and the sum of 45 million marks was voted, without discussion, for taking in hand the first instalment of the work. The scheme comprised the following: The construction of a new coal basin (Kohlenschiffhafen) east of the new entrance to the Köhlbrand in the former entrance to this channel; the enlargement of Kuhwärder Vorhafen by the northern portion of the old coal basin; the improvement of the entrance to the Vorhafen (the southern portion of the old coal basin was transferred to the Vulcan-Werke for their purposes); the deepening of Oderhafen—which was only provided with barge depth—so as to make it suitable for the accommodation of ocean-going vessels; the replacement of Oderhafen as a rivercraft basin by the newly-built Travehafen and Rodewischhafen; the extension of the southern belt canal to the Köhlbrand by the construction of Ellerholzkanal and Rosskanal, and the extension of Rosshafen as far as its junction with Rosskanal. Communication between the two Köhlbrand banks was to be effected by a train ferry and suitable landing places. West of the Köhlbrand the following improvements were provided for: The construction of three big harbour basins parallel to one another suitable for ocean-going vessels of maximum draught, viz., Griesenwärder Hafen, Waltershofer Hafen and Mühlenwärder Hafen; the construction of Parkhafen, the new Petroleumhafen, Jachthafen, and Maakenwärder Hafen; the construction of Rugenberger Hafen for the accommodation of rivercraft, and that of a lock connecting it with the Köhlbrand. The building of a bridge across the Köhlbrand was not contemplated, but the linking-up of the new harbour area west of the Köhlbrand with the existing railroad system was to be accomplished by the construction of the Finkenwärder and Waltershof Railway.

The major part of this comprehensive scheme—with the exception of the construction of Griesenwärder Hafen and Mühlenwärder Hafen, which was not intended to be taken in hand immediately—was completed before the outbreak of the war. The new facilities provided east of the Köhlbrand and the train ferry were ready in the summer of 1914. The excavation work on Waltershof was being actively proceeded with, Parkhafen, the new Petroleumhafen, Jachthafen, and Rugenberger Hafen had been practically completed, and some of these basins were already being used for their intended purposes, but the outbreak of the war delayed further progress, and after some time all work had to be stopped.

From the World War to the Present Time.

After the outbreak of the war the harbour operations, like every other part of the country's economic activities, had to be immediately adjusted to the altered conditions. The work going on in the quay sheds, shipbuilding yards, and other industrial concerns was, in some respects, even more brisk than in times of peace. Shipping, however, almost came to a complete stop about the close of 1914, when the last overseas steamer arrived in Hamburg, except that a lively interchange of goods with the Scandinavian countries *via* Kiel Canal could be maintained, the chief article exported to them from Germany being coal. The loading plants for coal and ore were used to their maximum capacity and were also made available for the purposes of the Imperial Navy. The pier cranes were utilised in like manner, because the sheds themselves, with insignificant exceptions, could not be used in the normal way. They were quickly emptied of the articles for export that had accumulated there when the war broke out, and were subsequently made use of for a number of purposes connected with the war. Some were used by the commissariat as store rooms for provisions, others by the various Government organisations created in connection with the conduct of the war, and so on.

Some of these organisations continued to exist after the close of the war, and it was not until the early part of 1921 that all the quay sheds could be utilised once more for the purposes they were intended to serve. It was no easy matter, therefore, to satisfy the demands of shipping which commenced to undergo a rapid increase after 1920. Once a beginning had been made in re-knitting the ties that the war had severed, trade and traffic speedily resumed their pre-war proportions. Near the close of 1920 the gross register tonnage of the ships calling at the Port of Hamburg equalled 50 per cent., early in 1923 100 per cent., and in 1929 more than 150 per cent. of the pre-war figure. Even though it is a fact that, owing to the state of the world's trade, the quantities of cargo handled in the port did not reach the pre-war level until 1928, they were nevertheless so considerable that the sheds were sometimes crowded with them and that their efficient handling was a matter of some difficulty, so that new extensions were once more required.

This development—which was not confined to Hamburg—was caused by the altered economic conditions after the war. The huge bulk cargoes that used to fill the ships' holds temporarily failed to be forthcoming, some of them, e.g., the imported cargoes of Chile saltpetre, being no longer shipped at all. General cargo and small lots of bulk goods dominated the traffic under the new conditions. Acceleration of despatch became more and more necessary where valuable cargoes, and cargoes subject to fluctuations in their value, were concerned. Many goods formerly carried by rivercraft now preferred the railroad, this being the faster of the two carriers. Certain economic rearrangements in the hinterland also caused a change in the routes of transportation which benefited the railroads to the detriment of rivercraft. The result was that transhipment on the quays, as compared with " midstream " transhipment, became subjected to a far heavier strain than before. In addition, the internal work carried on in the sheds was hampered by certain unavoidable delays in the manipulation of the goods, and by the increased demands of the latter on the quay space. The first-named inconvenience was due to the greater complications to which business became subject, to the greater differentiation of the lots, and to the additional time spent in weighing, whilst the second was caused by the increase in the quantities of cargoes for exportation that had to be handled on the quays. The collecting stations for export goods on the State quays increased from 104 before to 191 after the war, the latter figure corresponding to the larger number of shipping companies calling at Hamburg as compared with pre-war times. Exports, however, chiefly consisting of general cargo and having to be sorted according to their destinations in such a manner that they can be easily surveyed, make far higher claims on quay space than imported articles.

The altered conditions compelled the State Quay Administration and the private quay-operating concerns to do all they could in order to utilise their plant to maximum advantage. The means at their disposal were: a more rigid system of control, the utmost improvement of the organisation, and the use of modern machinery. It is due to the success that attended the endeavours carried out in all these directions that the Port of Hamburg may now claim to rank among the most progressive ports extant in regard to the facilities it possesses for the efficient handling of cargo.

However, the intensification of work just referred to was not sufficient in itself to satisfy the demands of the times. Although the financial difficulties confronting the city-state were enormous, the further expansion of the port could not be relegated to a future period. Moreover, the undertakings on which work had been suspended had to be completed. The number of shipping companies, both German and foreign, that made Hamburg a port of call for their big liners continued to increase, and the Board for Hydraulic Engineering (Wasser-

The Port of Hamburg—continued

baudirektion) found themselves confronted, at a time when the inflation crisis dislocated the whole economic life of the nation, with difficulties of unprecedent magnitude.

Director Bubendey, during whose tenure of office the great work of regulating the Northern Elbe and the Lower Elbe was completed, died in 1919, about six months after the cessation of hostilities. Director Wendemuth, who had already been in charge of harbour construction work under Bubendey, was appointed his successor.

The first task to be taken in hand was the extension of the transhipment facilities in the section of the harbour east of the Köhlbrand. Mention must be made, in this connection, of the construction, during 1915, of the " free loading plant " (Freiladeanlage) on Holthusenkai for the transhipment of bulk goods. During the same year work on the coaling quay (Kohlenumschlagsquai), on Kirchenpauerquai, with the wagon-tipping device for sea-going colliers and the corresponding plant for rivercraft, on Hofe-Canal, was actively proceeded with.

The conversion of Shed No. 23 into a fruit shed, already started before the war, was completed during 1915. Work on the new Shed No. 57 on Afrikaquai (Indiahafen), however, which was commenced about the same time as the conversion of Shed No. 23, went on until 1920. The first additional sheds actually completed after the close of the war were built by the Hamburg Government at the expense and for the use of two foreign shipping concerns, viz., the Royal Mail Steam Packet Company and the Americanische Verkehrsgesellschaft. The shed built for the former company is No. 80 on Sthamerkai (Oderhafen), and that for the latter concern is No. 84 on Rossquai (Rosshafen), both of them being completed in 1922. The last-named shed has recently been taken over by the United States Lines. The corresponding quay walls and quay berths were leased to the two companies for the duration of the agreement. The State itself took in hand the building of the following sheds, viz., Shed No. 56 on Afrikaquai (Indiahafen), completed in 1923; Shed No. 81 on Sthamerkai, completed in 1925; Shed No. 33 on Kirchenpauerquai, completed in 1926; Shed No. 85 on Rossquai, completed in 1927, and recently leased to the United States Lines; Shed No. 55 on Afrikaquai, completed in 1928; Sheds No. 82 and 83 on Chilekai; the conversion of Shed No. 24 on Versmannquai into a two-storey fruit shed, completed in 1929; the new Distributing Shed on Holthusenkai, completed in 1930, and Shed No. 59, completed in 1931. Almost all the sheds added during the post-war period belong to the largest type existing in the Port of Hamburg, their average floor space being 160,000 sq. ft. Moreover, six of them adjoin basins having a depth suitable for the biggest sea-going vessels (i.e., Oderhafen and Rosshafen), and this depth can be increased to 40-ft. below high-water mark owing to the nature of the quay walls with which they are lined. In addition to these various new structures the State extended the existing transhipment facilities by the purchase of several others originally erected by private enterprise. Thus, for instance, some premises on the east bank of Grenzcanal used for warehousing purposes were acquired in 1924, and turned into what is now Shed No. 64. Its site adjoins a basin possessing barge depth, and it is used for the collection of goods intended for exportation and of cargoes discharged in midstream. An event of still greater importance was the acquisition, in 1927, of the three eminently modern Sheds Nos. 60, 61 and 62 on Kamerunkai (Südwesthafen), built by a private firm with State assistance, in 1924 and 1926. After the transfer of the facilities for the transhipment of dangerous combustibles, etc., to the new Petroleumhafen on Waltershof, the Südwesthafen was deepened and provided with equipment for general transhipment purposes.

Altogether, 17 new quay sheds have so far been built during the post-war period. Their combined floor space equals about 35 per cent. of the floor space available before the war.

The work carried out by the State for the enlargement of existing facilities and for adapting them to new conditions was supplemented by private enterprise. Shipments of refrigerated goods acquired additional importance after the war, in 1920 the Kühltransit-Gesellschaft had a cold storage plant built in Shed No. 73. It is chiefly used for frozen meat and covers an area of 67,000 sq. ft. The same company started, in 1927, the operation of additional cold storage rooms covering 43,000 sq. ft. of floor space. These are located on two floors of the warehouse built by the Lager- und Speditions-Gesellschaft adjacent to Quay Shed No. 69 on Grevenhof-Ufer. The five-storeyed premises of the Eiswerke und Kühlhallen St. Pauli-Fischmarkt G.m.b.H. were built in 1926 close to the Hamburg fish market building. There up to 100 tons of ice can be made each day for the requirements of the fishing vessels and in connection with the transportation of fish, and 35,000 sq. ft. of cooling and refrigerating space are available for the storage of fish. In connection with Quay Shed No. 85 on Rossquai the firm of Kühlhaus Rosshafen S. Behr A.-G. has recently completed a cold storage building containing about 215,000 sq. ft. of warehousing space, with special installations for the prolonged storage of eggs. A cold storage building for herrings, containing some 108,000 sq. ft. of warehousing space, was erected by the State in 1928/29 on premises connected with Shed No. 16 on Grasbrookhafen. Among the facilities recently provided by private enterprise, the warehousing and transhipment installation erected by Messrs. Jordan and Berger on Kamerunkai (1925) and the quay-operating and warehousing business conducted on Grevenhof-Ufer and Reiherstieg by the Lager- und Speditionsgesellschaft, deserve special mention.

An important addition to existing facilities serving the needs of river transportation is the series of new buildings and constructions on Oberhafencanal, whilst further accommodation on water possessing barge depth has been provided on the island between Spreehafen and Veddelkanal, part of which is still available for future development. The island has been connected with the road and railway systems by a bridge.

At the same time when all this building activity went on in the older sections of the harbour, great stress was laid on the work of extending existing facilities west of the Köhlbrand. The first of the Waltershof group of basins, viz., the new Petroleumhafen, was ready for its intended use in 1913. Since that date its banks have been lined with equipment exclusively serving the needs of the oil industry and allied industries. Waltershofer Hafen is being increasingly used for " midstream " transhipment, more especially for the discharge of grain shipments by means of floating elevators. On its north bank, called Burchardkai, a quay wall about 2,000-ft. long and extending 42-ft. 8-in. below m.h.w., has been completed. It is available for quay operation. A harbour basin of very considerable size, called Griesenwärder Hafen, has been constructed in recent years south of Waltershofer Hafen. It is the first basin added to the existing ones since the close of the war. It covers an area of 90 acres, viz., 80 acres for the use of sea-going vessels and 10 acres possessing barge depth only. Its present depth is 36-ft. below high water, but this will be increased to 40-ft., so that it is capable of accommodating the largest type of vessels. Its south bank is lined with about 4,000-ft. of quay wall, thus providing opportunities for the transhipment of goods by the methods of quay operation. Sea-going vessels enter the basin *via* Parkhafen and rivercraft *via* the Rugenberger Flusschiffhafen, the passage connecting it with the latter basin being bridged. A novel feature is the provision of an enlarged basin for the accommodation of harbour lighters at the upper end of the part reserved for sea-going vessels, its depth being 20-ft. only. The north bank of Griesenwärder Hafen will be left sloping until the need for additional quay space makes itself felt. A row of dolphins, serving the needs of " midstream " transhipment, has been erected in front of the sloping bank. Subsequently, i.e., when both banks are lined with quay walls, the width of the basin will be 689-ft. The peninsula formed between Waltershofer Hafen and Griesenwärder Hafen, which has a width of about 660-ft., will provide sites for future quay facilities. Maakenwärder Hafen has for the greater part been reserved for the needs of coastwise shipping and Lower Elbe traffic, but quay equipment for the use of sea-going ships can be provided on its south bank, if and when required. It will be seen from the foregoing that Waltershof has still sufficient space for the development that may be expected to take place in the immediate future, and that it is not necessary for the time being to start harbour construction work in the Mühlenwärder Hafen area, the last reserve east of the Köhlfleth.

The connection of the Waltershof area with the railway system is effected by the Köhlbrand ferry and the Waltershof Railroad Line. The work of building the new railroad station between Griesenwärder Hafen and the Köhlfleth has already been taken in hand.

In addition to the foregoing, a great deal of building activity in other directions has also been going on in the harbour since the close of the war, e.g., the enlargement of the railroad facilities, the partial rebuilding of the Elbe bridges, and the provision of additional industrial sites.

Apart from carrying out the important tasks outlined in the preceding account, all of which were directly associated with her port, Hamburg, during the period under review, had to devote her attention to a number of other matters also closely affecting the further development of the former.

One of these matters is the problem of the projected Hansakanal, the construction of which has been advocated by Hamburg together with the other interested parties.

Other matters of this kind relate to the steps to be taken in compliance with certain provisions of the new German constitution dealing with the centralisation of customs and traffic affairs. When the railways previously operated by the federal States were transferred to the National Government, the Port of Hamburg Railway continued to be owned and operated by Hamburg. Customs matters, on the other hand, which had been administered by Hamburg since she joined the Customs Union and built

The Port of Hamburg—continued

her free-port, were taken over by the central authority in 1919. More important to Hamburg than either of these two changes was the transfer of the waterways from the States to the National Government, which took place on April 1, 1921. The measure deprived Hamburg of a privilege which she had exercised for almost seven and a-half centuries, and which had been of eminent benefit to her in developing into a port of international status. However, after prolonged discussions preceding the transfer she was promised that the task of regulating the Lower Elbe and of maintaining the proper depth of the channel leading from the sea to her harbour should continue to be performed in the same efficient way in which she had carried it out herself. The reach of the Elbe from Ortkathen to Blankenese, being regarded as an integral part of the Port of Hamburg, was immediately re-transferred to the Hamburg administration.

Joint Port Operation by Hamburg and Prussia.

In connection with the preceding account of the most recent period in the history of the Port of Hamburg—a period replete with changes of fundamental importance—we must briefly comment upon the possibilities of its future development.

As far as the older section, i.e., the part of the harbour east of the Köhlbrand, is concerned, they are very limited indeed.

The opportunities in the Waltershof district have already been described above.

Apart from the foregoing, the only parts of the area of the City State of Hamburg still available and suitable for the extension of her port are Dradenau and the Hamburg portion of Finkenwärder. On the other hand, the Government of Prussia has already taken in hand harbour construction work on a fairly considerable scale in those parts of Prussian territory which are closely adjacent to the Port of Hamburg. The facilities, however, created there cannot be said to have much chance of an adequate future development unless organic connection is established between them and the world port of Hamburg, and unless some method of joint administration is resorted to. It is evident that such a situation as this was bound, sooner or later, to suggest the advisability of co-operation between the Governments of Hamburg and Prussia, and such co-operation was actually established by the interstate agreement of March 9th to 13th, 1929, the object of which is to develop along uniform lines the various harbour areas of the Lower Elbe, and to ignore the political boundary line that separates them. The joint measures contemplated under the agreement relate—apart from town planning, settlement and traffic matters—chiefly to port operation. A uniformly administered port of Greater Hamburg, consisting of the ports of Hamburg, Harburg-Wilhelmsburg and Altona, is to be created, although the three towns concerned will retain in full the independent administration of their respective ports. However, the development and operation of the harbour area of Kattwyk, Hohe Schaar and Neuhof has been entrusted to a joint undertaking, the Hamburgisch-Preussische Hafengemeinschaft G.m.b.H., with headquarters in Hamburg. The members of this partnership are the Governments of Hamburg and Prussia, both of them being equally represented in the management and on the board. Apart from the area subjected to such joint operation—the development of which has been taken in hand immediately—another area has been set aside for future harbour extension work, and the two contracting parties have bound themselves to abstain from creating there any establishments which might conflict with the intention of utilising it for the purpose just mentioned. The first thing to be done in connection with it is to draw up a plan for sub-dividing it into smaller units. A few characteristic facilities available in the ports of Harburg-Wilhelmsburg and Altona and in the jointly administered area—all of which, together with the Port of Hamburg in the restricted sense of the term (Hamburger Hafen) form the Port of Greater Hamburg (Hafen Hamburg).

The interstate agreement of 1929 constitutes the chief event in the modern history of the Port of Greater Hamburg, because it ensures that—as far as space is concerned—all requirements that may in future be made upon the leading German seaport, which is at the same time one of the most important organs of international commerce, will be completely met.

The Port of New Orleans

Reductions in wharfage charges and other port charges have been instituted by the Board of Commissioners of the Port of New Orleans. Effective October 12th, after the first day that a ship lies at the port's wharves, wharfage will be charged for fractional parts of a day at the rate of 12½ per cent. of that day's rate for each hour to and including seven hours, after which time the vessel is charged for a full day. Under the tariff formerly in effect vessels were charged a full day's wharfage for a fractional part of a day at the wharf.

At the public cotton warehouse the receiving charge on cotton and linters was reduced to 20 cents per bale from 25 cents per bale. Storage charges on cotton were reduced to 8 mills per day per bale from 1 cent per day. This rate applies to high density, standard and flat bales. Substantial reductions were also made in the charges for various other services performed by the warehouse, such as drayage and patching and marrying bales.

The facilities of the Port of New Orleans are unexcelled. Vessels are loaded and unloaded with the utmost dispatch, thus expediting the movement of the vessels and resulting in economy of operation. With the reduced charges it is hoped that the Port of New Orleans will experience a sharp revival in its business.

Substantial increases in many commodities moving over the wharves of the Port of New Orleans during September are disclosed by figures compiled by the Dock Board.

Textiles exported increased 18,514 tons; vegetable food products exported increased 5,946 tons; other vegetable products exported increased 856 tons, and animals and animal products exported increased 708 tons.

During September 182 ocean-going vessels arrived in port. There were 175 departures of such vessels. The ocean-going vessels arriving had a total gross tonnage of 752,905 tons.

Vessels using the public wharves during the month totalled 606,747 gross tons. Cargo paying tollage amounted to 175,178 tons.

The Board's automatic conveyors unloaded 1,026,722 bunches of bananas during September.

The Inner Harbor-Navigation Canal was used by 1,080 vessels, having a total tonnage of 395,523 tons. Arrivals of inland watercraft of over 25 tons numbered 287 vessels, which had a total tonnage of 101,859 tons.

Of the 182 sea-going vessels arriving during the month, 109 having a total tonnage of 482,246 tons flew the American flag. This represented almost 60 per cent. of the ships and 64 per cent. of tonnage. Honduras was second in number of ships and also in tonnage. Norway was third in both ships and tonnage.

Following is a tabulation showing nationality, number of ships and total tonnage of ocean-going vessels which arrived during the month:—

Nationality	No. of Vessels	Gross Tonnage
American	109	482,246
Brazilian	2	9,847
British	6	32,001
Danish	1	3,105
Dutch	2	15,512
French	2	11,658
German	5	18,591
Honduran	27	84,775
Italian	6	34,611
Japanese	3	19,051
Nicaraguan	2	1,751
Norwegian	16	35,152
Swedish	1	4,575
	182	752,905

Reich Loan for Hamburg Port Construction.

Within the German Government's programme for providing employment, the Deutsche Gesellschaft fur Offentliche Arbeiten is to accord a loan of Rm.2,925,000 to the State of Hamburg for port construction work, the expenditure of which, it is stated, will represent 115,000 working days and enable a large number of men to be employed. The work to be undertaken will include the deepening of the Kaiser Wilhelm harbour basin in front of Quayside Sheds Nos. 71 and 75 and the reinforcement of the quay walls thereat; the reconstruction of the old Reiherstieg bridge, which was built in 1884, and the rebuilding of the bridge over the Veddel Canal, the iron superstructure of which is over 30 years old. These bridges are no longer adequate to cope with the modern harbour traffic and are in need of reconstruction. The improvements at the Kaiser Wilhelm harbour basin will, it is said, add to the efficiency of the trans-Atlantic services of the Hamburg America Line.